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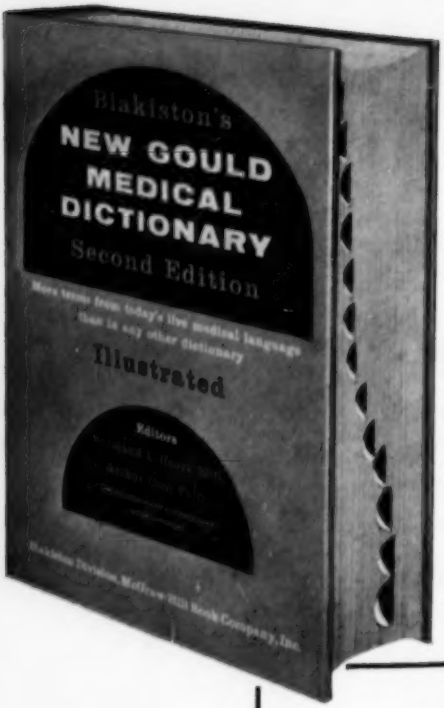

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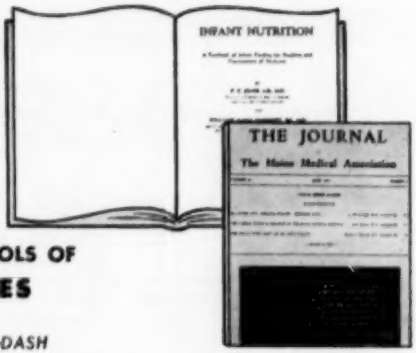

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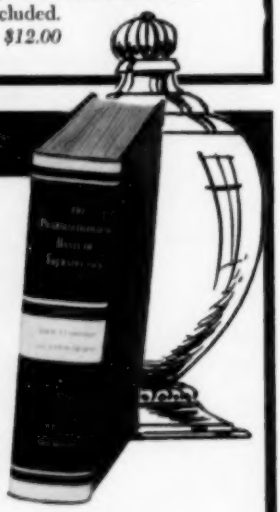

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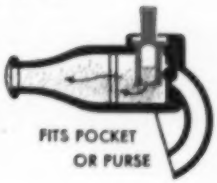

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*The American Foundation: Medical Research: A Midcentury Survey, Boston, Little, Brown and Company, 1955, vol. 1, p. XXXI.

**Ibid., p. 600.

Reports on Experiments in Medical Education

Introduction

THE PAPERS presented in this symposium represent a convergence of several forces which are currently active in American medical education and which give hope of fitting it better to the needs of the people and to the desires of physicians. These forces include the introduction into the medical curriculum of a concern for the patient as a person and consequent integration of teaching and the application of principles from the behavioral sciences both to teaching and to patient care.

In recent years several medical schools, among them Colorado, Cornell, the University of Pennsylvania, and Western Reserve, have embarked on such innovations in medical education. At Western Reserve the entire curriculum has been revised; while at Pennsylvania a family health advisor program has been developed for students beginning in the first year and extending through four years; and at Cornell a course in comprehensive medicine has replaced traditional out-patient teaching in the fourth year. At Colorado a General Medical Clinic has been developed.

Faculty members associated with each of these projects have been desirous of learning something about the effects of such innovations on student learning. Methods for testing increments in medical knowledge have been long established, but with these particular curricular changes it was anticipated that there would be a shift in student attitudes and values which it would be equally important to study and for which there were no well established definitive methods in use. Social scientists and psychologists, having developed methods for studying opinion change to a high degree, were brought in by the medical faculties to help in evaluating shifts in student attitude. Coincidentally, a group of sociologists under the direction of Professor Robert K. Merton at Columbia University have become interested in the pressures in medical education that form the student into his professional role as a physician. Since the medical school represents a special social environment, study of this environment by the methods of social research might be expected to reveal the nature of these pressures; and such studies in the schools mentioned might serve the purposes of sociology, psychology, and medical education.

There are indications in the papers herewith presented of the early results of this liaison. Professor Merton and Mr. Bloom have indicated in their paper some of the preliminary findings of analysis of student attitudes at the University of Pennsylvania. The report from Colorado indicates the challenges and opportunities in a comprehensive approach. The papers from Western Reserve show the magnitude of the curricular change and outline the importance of evaluation through methods such as Professor Merton has used. Likewise, Dr. Reader's paper illustrates the value of having information available from social research for an understanding of what happens to students as a result of their learning experience in a new teaching program.—JOHN Z. BOWERS.

WESTERN RESERVE

1. Background and Philosophy of Experiment

JOSEPH T. WEARN

AN EXPERIMENTAL program in medical education is now in its fourth year in the School of Medicine of Western Reserve University.[1-3] From the beginning of the planning and implementation it was decided to conduct the experiment in as scientific a method as possible, making a serious attempt to use controls where feasible, and making serious attempts to devise methods for evaluating the results. It is our firm belief that if there can be constant and continual experimentation and appraisal of our teaching methods and curricular content, true research in medical education will have been accomplished and a contribution may be made.

Perhaps it is pertinent to give some of the background and motivating philosophy of the decision to undertake this experiment. When we stand off, with the advantage of 10 intervening years of perspective, and look sharply at what happened to medicine during the five years of World War II, we see a most incredible concentration of challenges, changes, stresses, achievements and catastrophes: the calling to active duty of an inordinate number of physicians, leaving the civilian population inadequately covered and the medical faculties seriously crippled. There was created the Office of Scientific Research and Development with its Committee on Medical Research. With the National Research Council, these organizations called to Washington many of the medical scientists and educators of the country to take part in war activities with the resulting meetings of medical scientists and educators from all over the world; there was the opening up and outpouring of vast government funds for the support of medical researches and for the establishment of new facilities for even more researches, in the medical schools; the demand for more and more young physicians with the shortening of the curriculum and internships by the imposition on the schools of the accelerated program; the taking over of the selection of medical students by the armed services; the demands on our young physicians to meet new medical and psychiatric problems in every war theatre all over the world; and finally the brilliant scientific advances in the entire field of medicine. In addition to these forces, the medical profession found itself facing a new and pressing obligation as a result of the social and economic changes which we are still witnessing. All of these portentous events, in addition to the new mass of accumulated medical knowledge from the turn of the century, heaped on the already over-

Dr. Wearn is dean and professor of medicine at the School of Medicine, Western Reserve University.

loaded medical curriculum, faced faculty and students alike with an insuperable task.

Little wonder then that medical educators throughout the country became greatly concerned with the many problems presented, and the depth of their concern led, in turn, to the various new experiments now in progress in many medical schools in this country.

Method of approach

It was just such stimuli as these that spurred the thinking and discussions that resulted in the experiment at Western Reserve University. We were especially fortunate in having a new young faculty—men who without exception, felt the need for improvement in medical education, who were not bound by tradition and who were ready to face the prodigious task inherent in working out a new approach to the education of medical students.

There followed five years from 1945 to 1950 of conferences and intensive study, during which time members of our faculty visited many of the schools in this country and some in other countries. Valuable ideas were gleaned in this way. In 1950, as the proposed new curriculum began to crystalize, it became increasingly obvious that a full time coordinator was essential before necessary plans for the transition could be worked out. Dr. T. Hale Ham has served as chairman of our Committee on Medical Education since 1950 and has participated in the planning and launching of the program.

From the beginning, we faced the fact that the accumulated mass of knowledge had reached such proportions that no medical student's mind could absorb it, nor could any faculty present it. Therefore, we abandoned all thought of total coverage. Instead, we agreed that emphasis must be placed upon the basic concepts, the mechanisms of disease, continuing self-education, the development of a scientific critique, the development of powers and skills and the inculcation of ideals. It was realized in this connection that the example set by the faculty would play an important role.

Another fact upon which we found ourselves in agreement was that medical teaching had become too compartmentalized and that the dividing line between the preclinical sciences and the clinical departments had become too sharp.

Goals agreed on

We therefore agreed to try to achieve greater integration in our teaching, both interdepartmental and in the clinical and preclinical disciplines. This, we felt, could be achieved through group planning and group teaching—the groups being made up of members from the various departments. It was felt that early in his first year, the student's interest in the preclinical sciences could be greatly stimulated by relating these sciences to the living patient, first, by introducing the student to patients at that time and then by carrying the preclinical sciences into and through his clinical years.

The faculty also agreed that our medical students should be treated more as colleagues, and be given the same general status that Ph.D. students enjoy. By this means it was hoped that needless competition and grade consciousness would be eliminated.

Finally, we realized after these years of intensive thought, that medical education itself should receive far more attention. Indeed, it should

be subject to continuing experimentation and critical reappraisal, and maintain such fluidity that it could keep pace with the rapid developments in medical science and with the profound social and economic changes. We concluded, therefore, that there can be no such thing as a fixed curriculum and teaching methodology, and that continuing research in these subjects with constant change was the only possible answer.

With these objectives in mind, the years 1950 to 1952 were given over to a most intensive attempt to reduce our thoughts to a detailed planned program. Literally hundreds of conferences were held, disputed points thrashed out and at last, in September 1952, the first class of students was admitted under the new program.*

The first three years of the program are now well launched, although subject to constant reappraisal and revision. The initial results have been gratifying to faculty and students. In the third and fourth years, the clinical phase is in the process of being worked out. Consequently this is a preliminary report of an experiment in progress.

* For many years, beginning with the end of the war when problems of medical education became so acute, many conversations were held with Dr. Lester J. Evans of the Commonwealth Fund. With the formulation of a broad experiment in medical education, The Commonwealth Fund has endorsed the program and given generously to it's support since 1950.

* * *

Antecedentes y bases del Experimento

En este primer artículo de una serie de cuatro, el Profesor J. T. Wearn, Decano de la Escuela de Medicina de Western Reserve, informa sobre los antecedentes de un experimento que ahora está en su cuarto año de desarrollo. Las necesidades y emergencias que, tanto en la práctica como en la enseñanza médicas, produjo la Segunda Guerra Mundial; las nuevas obligaciones y problemas creados por los cambios sociales y económicos de la Post-Guerra; la enorme acumulación de nuevos conocimientos científicos, y, también, los fondos considerables que el Gobierno de los Estados Unidos puso en años recientes a la disposición de la investigación médica científica, contribuyeron a que se iniciase una revisión radical de la Educación Médica, tarea que, desde 1945, fué emprendida con entusiasmo por la Facultad de Medicina (todos profesores jóvenes) de la Western Reserve. Se reconoció la imposibilidad de abarcar, en la enseñanza, todos los conocimientos científicos acumulados desde principios de siglo, y la necesidad de poner el énfasis en los conceptos básicos, en el mecanismo de las enfermedades; énfasis también en el desarrollo, en los estudiantes, de facultades críticas, así como de fuerzas y habilidades profesionales, y en la inculcación de ciertos ideales. Se reconoció además que la línea divisoria entre ciencias preclínicas y departamentos clínicos era demasiado rígida, y que era necesaria una mayor integración. Se acordó, sobre todo, que la Educación Médica debía ser, en sí misma, contínuamente objeto de estudio, crítica y revisión, a fin de responder al rápido desarrollo de la ciencia médica y a los profundos cambios sociales y económicos.

En Septiembre de 1952, fué admitida bajo el nuevo programa la primera clase de estudiantes. Los resultados de los primeros tres años han sido satisfactorios para profesores y estudiantes, aunque varios aspectos del nuevo *curriculum* están contíuamente sujetos a revisión, y los cursos clínicos para estudiantes del tercer y cuarto años aun no están completamente delineados.

2. Methods in Development and Revision of a Program of Medical Education

T. HALE HAM

MEDICAL EDUCATORS recognize the difficulty of changing the program of medical education to meet the changing needs of the day. Currently the several professions find themselves challenged by an enormous heritage of information, new practices, and rapidly advancing knowledge. The educator in any of these fields must choose not only the facts but the methods which the student will employ to educate himself during a professional life of approximately 40 years.

The professional fields require reliable methods for the development and the continuing change of a program of education. The curriculum is only a part of the total program, namely, the course of study which is derived from a long series of steps in reasoning.

This presentation is limited to the discussion of three possible methods that appear essential for the development and continued evolution of a program of medical education. It is believed, however, that many aspects of these methods have general application whereas any one curriculum may not be applicable in another school.

The three methods that will be outlined include: (1) an experimental approach in medical education, (2) a democratic method of working with the faculty, and (3) an organization of a whole program of a school and its affiliated organizations as related to education, research and service.

The educator is challenged by the strong forces of the contemporary period. Baughman[4] has studied methods of medical education during the past two centuries in this country and presents a hypothesis that three major influences determine what is taught at any given period, i.e., the medical practices of the period, the educational methods of the day and the scientific knowledge. Examples of changing forces are given by Lippard[5] in his discussion of the period after 1910. Currently the specialties in medicine have a large influence.

The experimental approach

From a dilemma of complexity the educator can turn to the experimental approach to serve as a guide. For example he can define with some clarity a series of steps which will permit research to be done. Beginning, first, with a description of the responsibilities of the medical profession it is possible, then, to outline the objectives of a program of education to prepare for medicine. With these objectives as guides the faculty and students are chosen. These four steps establish many of the directions of the experiment. There follows the choice of educational methods, special aspects that relate to medicine, the

Dr. Ham is professor of medicine and chairman of the Committee on Medical Education at the School of Medicine, Western Reserve University.

facilities and finally the program or curriculum. The results would include a description of what occurred, measurements of performance where possible and interpretation or evaluation. Methods of evaluation are crude and limited as yet.

The democratic method of working with a faculty is considered essential to the university tradition. This has been attempted by combining careful staff work with the trusteeship and the communications that result from responsible work of committees. In the particular experiment at Western Reserve University the written statement of objectives, broadly expressed, served as a guide for more than 200 experts who planned detailed aspects of the program. A Committee on Medical Education has complete representation from the director of each department. It reports to the general faculty but is advised by a series of subcommittees of experts. There is no doubt that these experts have set the major policy for their fields but have worked within the overall objectives. By this method true responsibility was delegated to the individual member of the faculty and communications also resulted.

From an organizational plan it was possible to arrange the programs of education, research and service in a complex situation of a medical school and its affiliated hospitals and services. As shown in Figure 1, the departments of the school of medicine and of the individual hospitals have been left intact with their respective budgets, personnel, research, service and their teaching of graduate and other

FIGURE 1: Organization of the School of Medicine

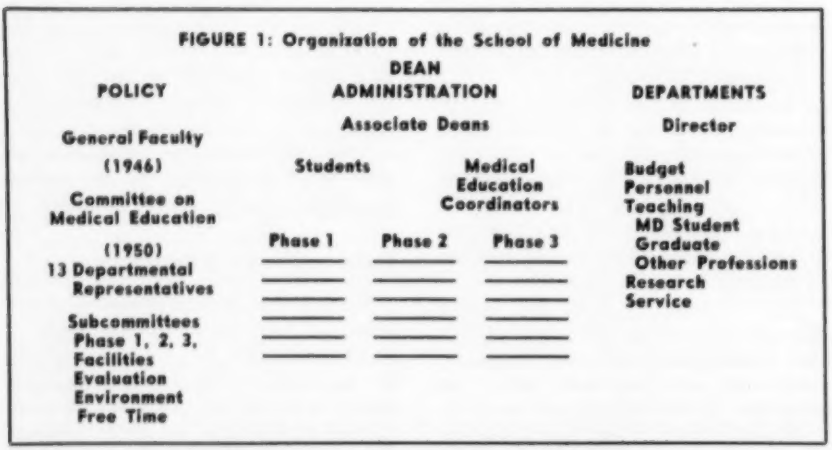


FIGURE 1. THE ORGANIZATION OF THE SCHOOL OF MEDICINE. As indicated in diagram, the thirteen departments of the School of Medicine are responsible for all faculty personnel and are represented on the Committee of Medical Education which is responsible to recommend policy to the general faculty concerning curriculum. The program of education, when approved is carried out by subject committees in Phases 1, 2 and 3. Each subject committee is directed by a chairman and is composed of members of different departments as agreed to by the directors of the departments. The associate dean of medical education provides administrative leadership and certain centralized services such as management of the laboratories, stock rooms and production of syllabus material. The Coordinators of Phases 1, 2 and 3 serve as leaders for the chairmen of subject committees of their respective phases and of an executive committee composed of the directors of departments that are most concerned with the particular teaching program. This organization is in itself experimental.

students. The teaching of medical students in the three phases has been done by subject committees whose members are recruited from the several departments. The policy for teaching of the medical student is determined by the general faculty, the Committee on Medical Education and its experts. This system is comparable to the democratic form of government of the United States. Each department is comparable to a state with its director (governor). The administrative branch has the privilege to recruit personnel and the authority to execute approved policy. Policy is formed by the legislative bodies. The legal faculty of professors serves as a supreme court. Such a system can be effective if all of the several branches are strong.

It is observed that a preliminary trial has been made for a period of six years of combining a research method with a democratic organization for development and application of a program of medical education. This combination of methods can establish a gratifying and effective university environment and can be organized in a complex medical center.

Métodos de desarrollo y revisión de un Programa de Educación Médica

En el presente artículo se discuten tres métodos, esenciales para el desarrollo y contínuo mejoramiento de un programa de Educación Médica: 1) El método experimental; 2) el método "democrático" (la colaboración de toda la Facultad), y, 3) la organización del programa entero de una Escuela de Medicina en relación con la enseñanza, investigación y servicios médicos. Estos métodos, que no son exclusivos uno de otro, sino que pueden a veces combinarse útilmente, son discutidos detalladamente por el autor (Profesor de Medicina y director del "Committee on Medical Education" de la Western Reserve), en relación con los procedimientos adoptados actualmente en la reorganización del Programa de Educación Médica que se está llevando a cabo en dicha Universidad.

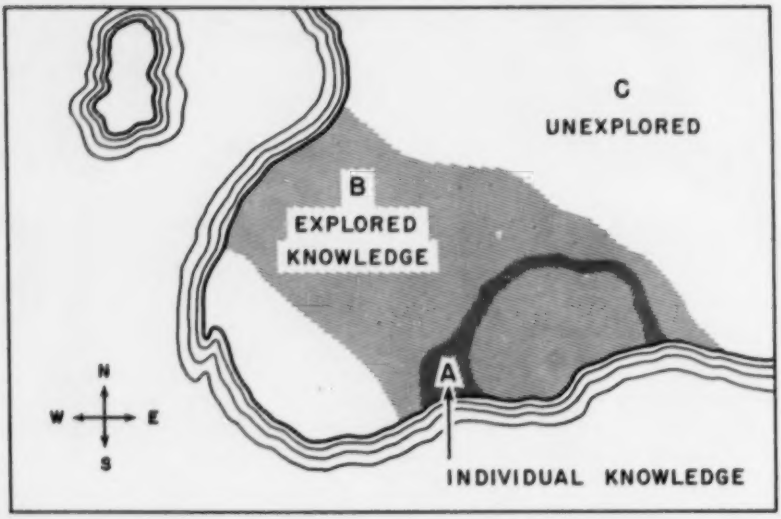
3. Interdepartmental and Departmental Teaching of Medicine and Biologic Science in Four Years

JOHN W. PATTERSON

IT IS GENERALLY accepted that it is impossible for a medical student to learn all the facts that he will be required to know for the remainder of his professional career. This refers to the mass of facts which are now known as well as those which may be revealed in the future. Therefore, it is necessary to delineate those facts which the student is to learn and to emphasize general principles from which other facts may be deduced. It is also necessary to emphasize the methods by which problems are solved.

The problem of obtaining the

Dr. Patterson is associate professor of anatomy and associate dean of medical education at the School of Medicine, Western Reserve University.



AREAS IN WHICH PROBLEMS FALL

proper balance between facts and concepts is not easy. Individuals in different departments in the same school and individuals in the same department in different schools might offer varying solutions. In a questionnaire circulated prior to the teaching institute on biochemistry, physiology and pharmacology, the question was asked, "Who is best fitted to determine how much and what to teach in each of these subjects?" The question was put to teaching members of the American College of Physicians, nonteaching members of the American College of Physicians, general practitioners, interns and teachers of each of the subjects concerned. In each case the group questioned felt that they were best fitted to determine how much and what should be taught. It would appear that each of these groups feels that it has something to contribute to the teaching program in each subject that is considered. Therefore, it might be wise to plan programs of medical education on an interdepartmental basis.

When the student eventually becomes a physician, he will be faced with problems which fall in three different areas. The problem may fall in the area of his individual knowledge and may be solved on the basis of known facts and procedures. The problem may fall in the area of explored knowledge so that a solution may be obtained from the literature or a consultant. Or the problem may fall in an unexplored area where the solution can only be obtained by new investigation (Figure 1). The student should learn something about the methods of approaching problems in each of these areas. This can only be attained by actually participating in the use of the methods that are necessary in each of these areas. However, there is an inverse relationship between student participation and the "coverage of material." Thus lectures at one extreme involve little student participation but provide an opportunity for covering a mass of material. At the other extreme, projects require a maximum amount of student participation to

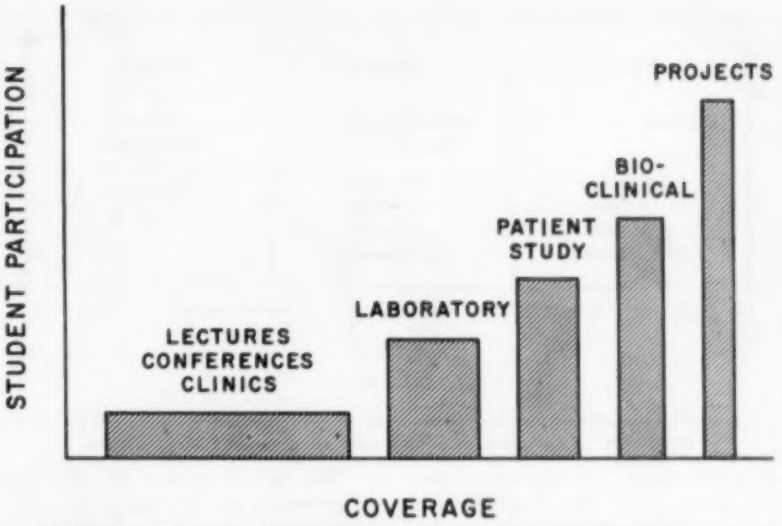


FIGURE 2. The inverse relationship between student participation and the coverage of material.

provide a minimum amount of factual knowledge (Figure 2). The faculty must determine the proportion of the students' effort that is to be devoted to the various learning techniques.

Therefore, it is the purpose of this presentation to describe a program developed on an interdepartmental basis in which students may learn the approach to problems in the different areas.

A major objective of any program of medical education is to see that the student acquires an adequate knowledge and skill. The faculty of the School of Medicine at Western Reserve University felt that this should be obtained in a manner consistent with certain specific objectives. It was felt that the organization of the material should be consistent with the desired thought pattern, that the biological sciences and patient study should supplement each other and that the student should obtain an integrated framework of knowledge which could be extended with experience.

Division of the program

The usual four year program was divided into three phases. The first phase, lasting one year, is concerned with normal structure, function, growth and development. The second phase, lasting one and one-half years, is concerned with alterations of normal structure, function, growth and development and the study of disease. The third phase, lasting one and one-half years, is concerned with the clinical application of the material learned in phases 1 and 2. It is felt that this sequence places an emphasis on the physiological interpretation of illness and provides a rational approach to disease as distinct from an emperical study of signs and symptoms (Figure 3).

With the accepted arrangement of a medical education program as two years of preclinical work followed by two years of clinical work, there is sometimes a feeling on the part of students that the preclinical subjects are merely intellectual hurdles which must be overcome in order that they

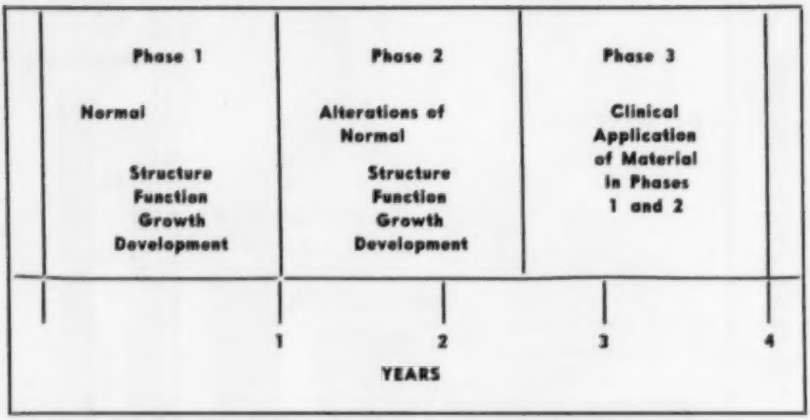


FIGURE 3. The division of a four year program into three phases.

may enter their chosen field of patient study. It is felt that there is need for understanding between the groups involved in each of these two areas and that their efforts should be supplementary throughout the four year program so that students may continue to see the interrelationships between biological science and the care and study of patients (Figure 4).

The physician has an integrated framework of knowledge which he uses in his career. The complete picture includes components such as anatomy, biochemistry and physiology. The final picture may be obtained by learning the contribution of each component consecutively, or by learning about all of the components simultaneously as one develops the total framework. It is felt that the

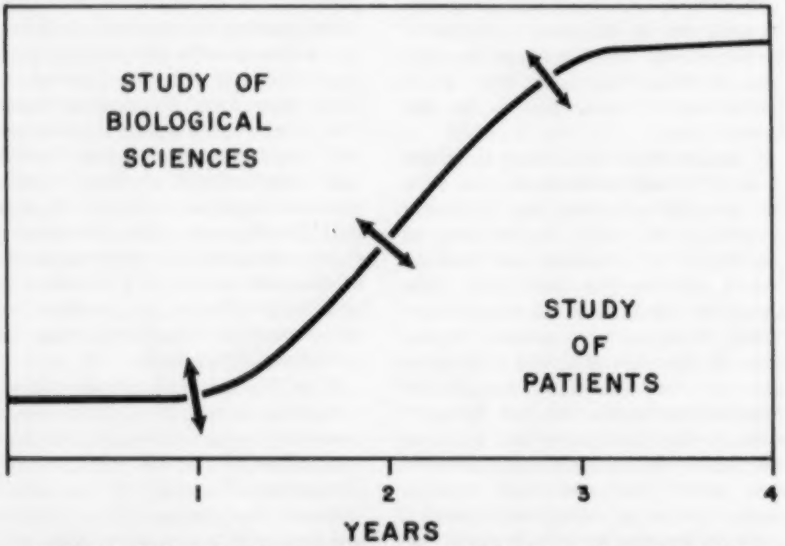


FIGURE 4. Biological sciences and patient study should supplement each other throughout a physician's career.

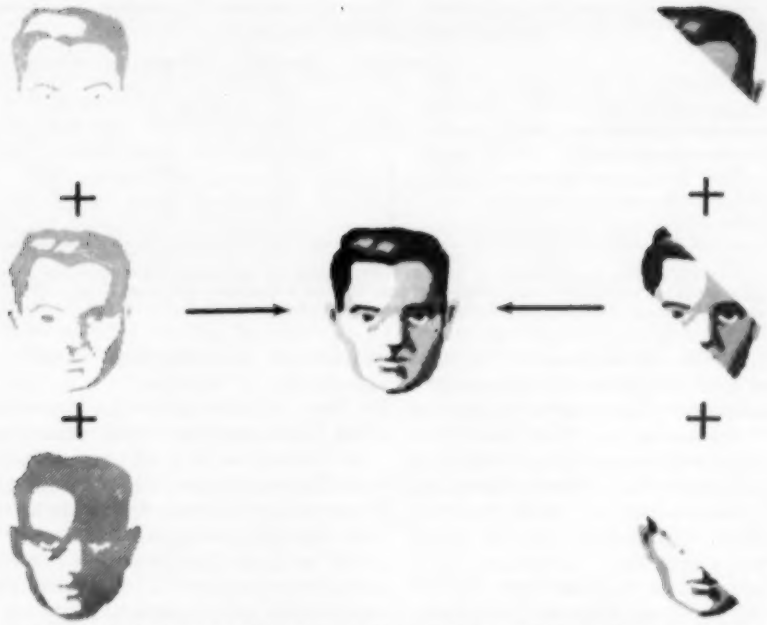


FIGURE 5. An integrated framework of knowledge may be obtained by studying different disciplines (left) or different subject areas (right).

student will do better with the latter approach which is more consistent with the type of thinking used by the physician (Figure 5).

These specific objectives may be achieved by using a subject committee approach to teaching. The material in any given department, such as anatomy, might be organized in a sequence starting with the cell, considering the organization of cells into tissues and the organization of tissues into organs and organ systems. Similarly the material in such courses as biochemistry and physiology might be organized in the same sequence. If the personnel used for teaching cell biology in each of these three departments is then organized into a teaching unit, one has a subject committee for cell biology. Similarly committees may be organized for each of the other subjects. This has been done for the material to be presented in phase 1 and the subject areas with the number of representatives from each department are indicated in Figure 6. Each committee, in addition to the basic science members, has one or more representative from the clinical departments. The faculty assigns to each committee a period of time for the presentation of the subject. The program is worked out by the committee with each member having a double responsibility. The committee member is responsible for seeing that the subject is presented in the best manner possible and also for seeing that the material of importance to the department is properly presented. The subject committees in phase 1 cover the material that would ordinarily be given in physiology, biochemistry and histology. A small amount of microbiology is included under cell biology and about 70 hours of gross anatomy lecture and dissection is distributed through the

SUBJECT COMMITTEES—PHASE 1

	Anatomy	Biochem.	Physiol.	Others
Cell Biology	1	3	1	3
Tissue Biology and Neuro-Muscular	4	1	2	2
Cardiovascular and Respiratory	2	1	2	1
Metabolism	2	2	3	1
Endocrines	2	1	4	1

FIGURE 6. The distribution of faculty effort may be arranged vertically by departments or horizontally by subject areas. Numbers indicate the number of representatives from each department on a given subject committee.

committees. Dissection in the first year is done on an infant cadaver. Dissection of the adult is postponed until the second and third year when it may be correlated with medicine and surgery. The subject committees are free to use whatever methods of presentation they desire. These include lectures, conferences and correlation conferences with clinical examples. The laboratory sessions vary from highly organized whole class exercises to experimentation in small groups with a minimum of direction.

Phase 2 is organized in a manner similar to that of phase 1. The list of subjects are indicated in Figure 7. The material of all of the departments not included in phase 1 is presented in an integrated fashion in phase 2.

Phase 2 Subject Committees

Second Year

Introduction to Disease
Chemical Agents in Disease
Infectious Disease
Cardiovascular System
Respiratory System
Hematopoietic System
Gastro-Intestinal System
Urinary System and Male Reproductive System
Skin

First Half of Third Year

Nervous System
Locomotor System
Special Senses
Endocrine System and Metabolism
Female Reproductive System

Figure 7.

The subject committee approach has been used for three years and has proved to be a successful method of presentation. It has the advantages of presenting the material in the integrated manner in which it will be used, of providing a basis of cross-communication between departments and is thought to make a greater impact on the student.

Planning for clerkships

The subject committee concept has been extended to the clerkships in the third phase. Phase 3 lasts for a total of 16 calendar months. This time is divided into eight months of compulsory clerkships, six months of electives and two months of vacations. There are three compulsory clerkships, a basic clerkship for four months, an ambulatory clerkship for two months and an obstetric and gynecology clerkship for two months.

The basic clerkship is planned by an interdepartmental committee. Instructors from different departments participate in the program and the students are assigned patients having "medical" and "surgical" diseases. The focus of attention is on the patient with an emphasis on thorough and complete study. The pace is adjusted to the learning situation depending on the difficulty of the problem and the ability of the student.

The period of four months provides a continuity of contact between the student and the patient and between the student and the instructor.

The ambulatory clerkship follows the same basic principles as the basic clerkship but provides experience with ambulatory patients. Inasmuch as it follows the basic clerkship, it is possible to assign greater responsibility to the student.

The obstetrics and gynecology clerkship is designed to provide experience in a different area with the methods of the basic clerkship being continued.

The elective program provides an opportunity for individualization of the student's schedule. Enough electives are available so that a single student could continue his schooling for a period of six years if he desired to take advantage of all of them.

Basic approaches and environment

In learning the approach to problems that fall in the area of explored knowledge, the student gains experience in a number of different ways. Early in the first year a short course concerning the medical literature is presented to small groups of students by the librarian. The students learn about the cataloguing of books, the indexes and abstracts of the literature and the journals in the field of medicine. They are assigned problems which they may solve between scheduled sessions. Thus they become acquainted with the literature by using it. At the same time they are also given a course in statistics in which they analyze data taken from the literature and discuss the presentations in a critical manner. Throughout the medical program the students have an opportunity to refer to the literature as they are studying the material in each of the phases. In phase 3, bioclinical sessions are assigned. These sessions are organized cooperatively with instructors from the basic science and clinical areas. They are run in the manner of a seminar with maximum participation by the students. Enrollment is limited to ten students per group and a single subject is considered for a period of sixteen weeks. Four hours are devoted to individual sessions thus allowing for a maximum experience in obtaining all the pertinent information related to the subject.

The student may learn about the approaches used to obtain knowledge in new areas by actually experiencing this process. Examples of the methods used in obtaining knowledge have been given in lectures and illustrated in the laboratory. In addition, each student must work on a project. The project may be in any one of the departments of the school and may be conducted in the library, laboratory or clinic. The organization of projects on a school-wide basis rather than intradepartmentally in a series of departments, makes it possible for the student to concentrate his effort for a long period of time. One day each week in the latter half of the first year and the latter half of the second year are scheduled for project activities. In the fourth year each student is required to submit a thesis as part of the requirement for graduation.

In order that the objectives of the program might be attained, it was felt that the appropriate environment was necessary. This involved understanding on the part of the faculty, a change in facilities, a new examination policy and the assignment of free time.

The understanding and interest of the faculty in the program is indicated by the success of the program

up to the present time. The program was developed by the faculty in a democratic manner so that the individual members were familiar with the overall objectives and interested in seeing them achieved. The faculty has solicited comments from visiting colleagues and students in their efforts to evaluate and improve their activities.

Laboratory and free time activities

With the integrated approach of the subject committee, it was felt that the laboratory activities should be centered in a multi-discipline type of laboratory. Therefore, laboratories were designed and constructed for each class in a way which permitted all of the laboratory work to be completed in a single location. Thus, instead of the seven departmental laboratories, the students work in three class laboratories. The space assigned to each student is available to him any time of the day or night and provides a home location for study and individual investigation. One exception is the gross anatomy dissecting laboratory. In this instance the old laboratory has been retained for adult dissection.

In former years as many as 32 course examinations were scheduled in a single year, making an average of one examination per week. The motivation of the student under such a system is self-evident. As he passes over each succeeding hurdle, it is time to prepare for the next. If a student is to develop in areas of his individual interest and on his own initiative, it is necessary to allow for the development of other motivations. Therefore, required examinations of record are now limited to a single comprehensive examination at the end of the year. These examinations are taken anonymously and each question is graded as satisfactory or unsatisfactory. Only those students with an overall unsatisfactory performance are identified by the committee on students and their record is studied by this committee in conjunction with the individual reports of project directors, preceptors and instructors with whom the students have personal contact. Practice examinations up to four in number are given during the course of the year and handled in the same manner as the comprehensive examination except for the fact that no students are identified.

The usual program of medical education provides a schedule from morning until late afternoon for a total of five and one-half days each week. This does not provide any free time during the week for the student to engage in activities which may be of particular interest to him and which might be helpful in developing his habits of self-education. Therefore, the faculty agreed that Tuesday afternoons and the whole day on Thursday should be reserved for the student as free time.

The program for the four-year period thus includes a variety of activities reflecting the opinion of the faculty with regard to the emphasis that should be placed on learning the approach to problems in the three areas in which they occur. The interrelationship of these areas may be indicated in a quantitative way in a diagram (Figure 8). The area marked clinical study with preceptors has not been described inasmuch as it is to be treated separately in a subsequent presentation. Inasmuch as the program of medical education should always be in a state of reexamination, it is probable that the situation as described in this presentation will be altered from time to time as experience dictates new improvements.

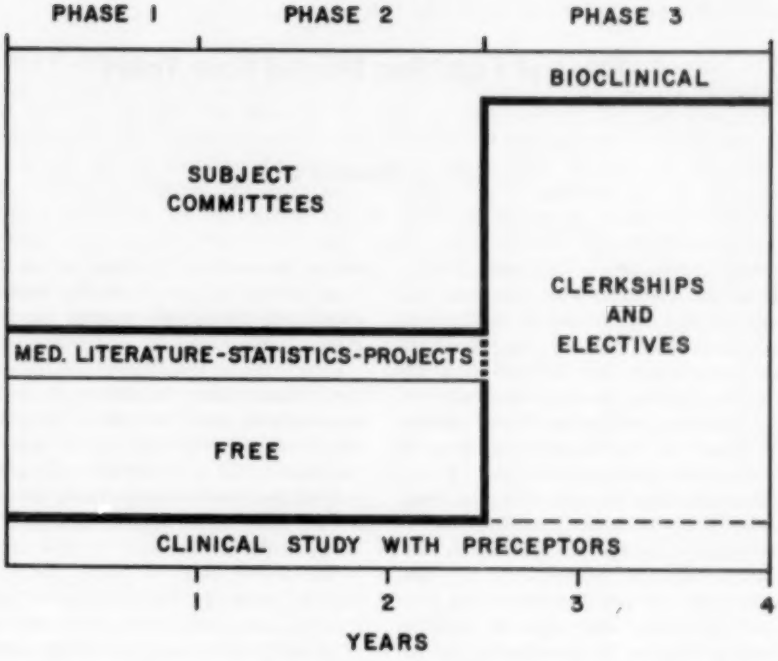


FIGURE 8. The distribution of time for various activities through three phases.

Enseñanza interdepartamental y departamental de Medicina y Biología

Hoy día se considera imposible que un estudiante de Medicina pueda aprender en el curso de sus estudios todos los datos que necesitaría para su carera profesional. Es necesaria, por tanto, una selección de conocimientos esenciales, poniendo el énfasis en los principos generales de los que otros datos se pueden deducir, así como en los métodos de resolver los problemas. Pero al hacer tal selección—para elaborar un programa de enseñanza—no resulta siempre fácil guardar el justo equilibrio entre hechos y conceptos; y, además los diferentes Departamentos de una Escuela, o los diferentes profesores de un mismo Departamento, no siempre estarán de acuerdo sobre cómo determinar cuales sean las mejores materias de enseñanza, o sobre quién será el mejor juez. Para solver este problema se recomienda la elaboración de un programa sobre una base inter-departamental. El autor del presente artículo ofrece como ejemplo de tal procedimiento la descripción detallada de la organización de un programa inter-departamental (Medicina y Ciencias biológicas) que fué desarrollado recientemente por la Facultad Médica de la Universidad de Western Reserve. Otra dificultad, en la elaboración de un programa de enseñanza, es causada por la tradicional división de la educación médica en dos años de trabajos preclínicos y otros dos años de trabajos clínicos, ya que muchos estudiantes consideran las materias preclínicas sólo como obstáculos que hay que superar a fin de poder entrar en el campo de los trabajos clínicos. De ahí la necesidad de coordinar los esfuerzos pedagógicos de esas dos áreas de enseñanza, a fin de hacer ver al estudiante la estrecha relación que existe entre las ciencias preclínicas, el estudio de las enfermedades y el tratamiento de los pacientes. El mencionado programa inter-departamental de la Western Reserve no solamente ha tratado de responder a esa necesidad de coordinación, sino que se ha tenido en cuenta también una necesario integración de las diferentes materias de enseñanza dentro de una misma disciplina. Algunos métodos para lograr esa integración son discutidos en el presente trabajo.

4. Clinical Teaching During Four Years

JOHN L. CAUGHEY Jr.

THE EMPHASIS in this report will be on the efforts of the Western Reserve faculty to create a climate in which the student can develop favorable attitudes toward care of patients and his professional responsibilities as a physician. These efforts are based on the hypothesis that, if the student develops a sense of responsibility for the care of individual patients, he will be stimulated to a continuing study of medicine, to a conscientious application of his knowledge for the benefit of the patient, and to an intelligent utilization of the resources of the community in the interest of his patient.

No attempt is made in this report to review the background of and reasons for this clinical teaching program. The previous papers have outlined some of these aspects.

Phase I (one year) three hours per week

Beginning two weeks after registration, each student is assigned to a patient of his own. The patients are selected from the antepartum clinic of University Hospitals by a medical social worker. The criteria for selection are a normal pregnancy, a stable family situation, and a willingness of the patient to have a "doctor-in-training" participate in her care. Patients living near the hospital and having one or two children are preferred. Because of facilities and patient availability, assignment of students to patients progresses at the rate of 8 or 10 per week, the process requiring about 10 weeks for the class of 80.

After being introduced to his patient, the student interviews her and arranges to visit her home to meet the husband and other members of the family. He is expected to be present at her subsequent visits to the clinic, and when she comes to the hospital in labor.

When the baby is born, the student's focus is transferred to the growth and development of the child. Well baby care is provided for these infants in a special Family Clinic in the department of pediatrics. The student is expected to keep in close touch with the family, visit the home at regular intervals and participate in the examination and management of the child in the clinic.

It is repeatedly emphasized to the student that responsibility for the care of the patients resides in the staff of the University Hospitals, initially in obstetrics and later in pediatrics. Clear lines of communication are defined for him within these departments.

In connection with the study of the patient, there is in Phase 1 a series of clinical science lectures covering the patient-physician relationship, elementary aspects of obstetrics, the physical and emotional growth of the infant, the family as a health unit and community resources for health service.

Close contact with each student is maintained throughout the year by

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a clinical preceptor who meets his group of eight students two hours each week. This time is devoted to discussion of the material covered in the clinical science lectures, the problems which develop in the families, and the anxieties or difficulties the students have in the role of doctor-in-training. Because each group stays together throughout the year, the students become familiar with each others' patients, and thereby expand their clinical experience.

The students are introduced to their patients by medical social workers who have made the initial contacts for selection of the families. These workers remain associated with the program and participate regularly in the preceptoral conferences. They are also available for consultation when social problems develop in the families.

Each student is expected, if possible, to arrange a home visit when the visiting nurse makes her initial contact with the family after the baby goes home from the hospital.

When illness occurs in the family, the student, aided by his preceptor, expedites the arrangements for appropriate services by the staff of University Hospitals. Although the students do not render any direct medical care, their personal attention is much appreciated by these patients who without such guidance tend to be baffled by a large institution.

Phase 2 (one and one-half years) four hours per week

Throughout Phase 2, the student continues observations on the growth of the baby in his family, by visits to the home and in the Family Clinic. If there are older children in the family, these are brought in as promptly as possible for examination and care in the Family Clinic.

In Phase 2, each group of eight students is supervised by two preceptors. After an eight week period of introduction to disease the students begin detailed studies of patients selected as much as possible to correlate with the material being covered by the subject committees. For this the students work in pairs. Four students from each group meet with one of their preceptors, the other four being with the other preceptor. Each pair of students is assigned to a patient, whom they interview and examine thoroughly. They review the records available. They then go home and each writes a detailed history, physical examination, and discussion of the pathological problem. The next week they meet with the same preceptor, in groups of four, go over the two cases they have worked up, and discuss them in detail. The next two weeks the process is repeated with the other preceptor.

In this way, by the end of Phase 2, each student has studied rather intensively about 20 patients, and participated in discussions of a similar number worked up by his colleagues in the group of four.

Phase 3 (one and one-half years)

Basic Science—one-half day per week

Continuity Program—one-half day per week

Required clerkships:

- Basic clerkship—4 months
- Obstetrics and Gynecology—2 months
- Group Clinic—2 months

Electives and vacation—8 months

Clinical teaching in Phase 3 is based primarily on the clerkship plan. Time does not permit detailed discussion of the efforts which have been made to improve the well recognized values of this type of teaching. The Continuity Program is an experimental method which deserves elaboration because of its relation to the clinical teaching of Phases 1 and 2, and because of the unique opportunity it provides for students to have extended personal contact with individual patients.

At the start of Phase 3, the class of 80 is divided into 10 groups of eight each. Each group of eight has a clinical preceptor. Two groups have the Continuity Program on Monday afternoon, two on Tuesday afternoon, etc. This means that no matter what other assignments the student may have, each week he has a half-day which he can count on and plan for in his Continuity Program with his preceptor. It means also, of course, that persons in charge of clerkships can count on having all their assigned students each morning, but on the average only four-fifths of them each afternoon.

In the Continuity Program the student has four categories of patients.

The family

The student follows the progress of the index infant, the older siblings, and frequently one or two subsequent additions to the family. In Phase 3 he also brings in the mother and father for complete health examinations under the supervision of the preceptor, and after this is done, assumes the role of family physician, with consultation from his preceptor and the staff of the University Hospitals.

Selected patients from clerkships

With the consent of his preceptor, the student may follow in the continuity program patients whom he has studied in ward or outpatient clerkships. A separate unit of the outpatient department, called the Continuity Clinic, provides appropriate offices and assistants for the students and preceptors.

Obstetrical patients

During the four months prior to the time he is scheduled to go on his obstetrical clerkship, the student spends part of his continuity time in the antepartum clinic. There he is assigned six or eight patients who are due to deliver during his clerkship. He follows these patients carefully, delivers them, and makes postpartum home visits. When necessary, he completes the six-week postpartum checks in his continuity time.

Patients with chronic disability

Each student is expected to follow throughout Phase 3 one or two patients selected because of persistant disability and some potential for rehabilitation. The student acts in most cases as a family physician under the guidance of his preceptor, and helps to mobilize medical and other community resources for the benefit of his patients. A grant from the National Foundation for Infantile Paralysis provides a team composed of physician, public health nurse, medical social worker, vocational counsellor and physical therapist, to help the preceptor in this part of the teaching program.

Discussion

At a meeting of this Association in Colorado Springs in 1949, a pro-

fessional educator from the University of Colorado defined education as a process which has an enduring effect on the attitudes, sense of values, and objectives of the student. This is to be contrasted with training, which is defined as the transmission to the student of special knowledge and skills.

An objective appraisal of medical faculty efforts might lead to the conclusion that our schools are placing great emphasis on training for medicine, but are not giving as much organized attention to the factors which influence the attitudes, sense of values and objectives of the students.

There are many reasons for this. Some believe the admissions committee should select only students with good attitudes, impervious to any damaging influence in medical school. Others believe that the clinical faculty clearly demonstrates in its teaching good attitudes toward patients and professional obligations, and that no other faculty effort is necessary to assure that the students will follow the good faculty example. There is some feeling that by the time students reach the medical school, it is too late to have any significant effect on their basic attitudes. There is preoccupation with the heavy demands of other teaching and of research.

This paper has reported an experimental program designed to create a climate in which the student can develop attitudes considered desirable in a physician.

The emphasis is on continuity of relationship between the student and selected patients, the student and his preceptor, and the student and his group of colleagues. The program begins as soon as the student enters medical school. Each student is personally involved in a responsible role with patients under circumstances which permit him to appreciate the patient-physician relationship, and to discuss his anxieties and other problems with fellow students and a clinical preceptor.

Experience with the clinical science program in Phase 1 has now covered four years and approximately 320 matchings of student with family. We have had no reason to believe that under the controls being used there is any damage to the patient or to the student as a result of these relationships. At first, the students are naturally anxious about their role, and about their acceptance by the family. These anxieties are very freely ventilated in the group conferences with the preceptors, who also have anxieties about their role.

Within a few months of entrance to medical school, and on the basis of personal experience, almost all the first year students learn that:

1. They can say to the patient they do not know the answer to a question without losing status in the patient's eyes, provided they take steps to find the answer and relay it back to the patient.

2. Without providing strictly medical service, they gain the confidence of the patient because of the interest they have in the health problems of the family.

3. That the patient is less anxious about labor and about health problems in the family when she can turn freely to the doctor-in-training for answers to her questions, and knows that a personalized service is available to her under his guidance at the medical center.

The methods used do not require a large portion of the students' time. In the first two phases, the clinical problems they encounter appear to stimulate many students' interest in the study of laboratory sciences, and in Phase 3 the Continuity Program

provides opportunity for the student to follow through with patients studied in ward and outpatient clerkships, and to learn some of the complexities of comprehensive health service outside the hospital.

Conclusion

An organized effort has been made to help the student appreciate the doctor-patient relationship and to deal constructively with his professional responsibilities as a physician. This experiment in medical education is in its early stages, but appears to have many potential values.

La enseñanza clínica de cuatro años

En este informe se destacan los esfuerzos que la Facultad Médica de la Universidad de Western Reserve está haciendo a fin de crear un ambiente favorable para que los estudiantes puedan desarrollar actitudes consideradas deseables en cuanto al cuidado de los pacientes y en cuanto a sus responsabilidades profesionales. El autor describe en detalle la organización del trabajo clínico de los estudiantes, que se divide en diferentes fases. Durante la primera fase, una serie de conferencias y discusiones sobre la ciencia clínica suplementan la práctica. El énfasis, en toda la instrucción clínica, se pone en la continuidad de las relaciones entre el estudiante y los pacientes a él asignados; entre el estudiante y sus preceptores y entre los compañeros de un grupo. De acuerdo con los fines principales, ya señalados, de esa enseñanza, se considera como especialmente importante que cada estudiante asuma un papel responsable frente a sus pacientes y que, al mismo tiempo, pueda, libremente, discutir con maestros y compañeros las particulares angustias y dudas que tal responsabilidad necesariamente origina, así como otros problemas suscitados en el curso de su trabajo.

El nuevo programa clínico no ha pasado aun la fase de experimentación. Sin embargo, por los resultados visibles hasta ahora, se puede anticipar su éxito en varios aspectos importantes.

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Research in Teaching of Comprehensive Medical Care

FRED KERN Jr. and KENNETH R. HAMMOND

THE RAPID GROWTH of scientific medicine during the last half century has led to the accumulation of a vast body of empirical knowledge. Thus, it is not surprising to find medical educators exhibiting concern over the problem of making the appropriate amount of this increased knowledge available to the student within the limits of the usual undergraduate curriculum. Any attempt, therefore, to make the curriculum more extensive perhaps at the cost of intensiveness, deserves close scrutiny.[1]

Yet the fact must be recognized that society needs and supports medicine as a discipline primarily because of society's need for medical care; that is, the application of medical knowledge to patients. Medicine thus performs and always has performed a function distinctly different from many other sciences. In other disciplines, paleontology for example, scholars who delight in exploring the past and in making discoveries may, with impunity, refuse to become interested in the practical application of their knowledge. Since the majority of medical school graduates, however, will be involved in the application of their knowledge as a lifelong vocation, the teaching of medical care, as well as medical facts, is a necessary obligation of the medical school. While some medical educators regard the application of facts to patients as a trivial matter to be learned after graduation by means of a little "common sense," we believe that the development of the student into a physician capable of the *effective* application of basic medical knowledge can be enhanced by the conscious effort of his teachers. We do *not* refer to the details of practice, the time saving devices, the short cuts or the economics of practice. Our interest is in broadening the student's understanding of and sense of responsibility for the patient so that as a physician, he may offer to the patient the maximum benefit of available knowledge. We believe that a broad understanding of the patient, including the pertinent psychological, social and cultural features, as well as the biological, referred to as comprehensive medicine, is essential for effective patient care.

We recognize that this concept of

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No. Students		Summer and Fall		Winter and Spring	
G M C 40	20	G M C		Free	Surgery
	20	Free	Surgery	Surgery	Free
		Surgery	Free	G M C	
Non G M C 40	40	Rotation thru clerkships in			
		Pediatrics	6 weeks	Medicine	12 weeks
		O.B.	6 weeks	Surgery	12 weeks
		Free	12 weeks		

FIGURE 1: SENIOR CURRICULUM

comprehensive medicine is not new and that it has long been practiced and taught, both by precept and by declaration, by many individual physicians in most medical centers. Usually such teaching is done, or not done, depending upon the interests and point of view of the individual teacher. Can this concept be formally included in the undergraduate medical curriculum with success? Its success would be determined by answers to the following questions:

1. Do the students acquire new and useful knowledge, skills or attitudes?
2. Is their learning of accepted scientific facts hindered?

The University of Colorado School of Medicine initiated in 1953 an outpatient facility, called the General Medical Clinic, for the purpose of teaching and demonstrating comprehensive medical care to medical students. This clinic was undertaken as an experiment in medical education in an effort to answer these questions. It was not visualized as a panacea for the ills of medicine and medical education. Despite an awareness of the difficulties and pitfalls of this approach to medical education, it was regarded as one possible means of producing better physicians. It was not designed as a pet program to be protected and promoted with zeal and fervor, but as a project to be examined objectively and critically. The clinic was accordingly conceived in the spirit of scientific inquiry. Therefore, when it became administratively feasible to divide the senior class into two equal sections, the opportunity thus provided for controlled experiment was welcomed, and carried out in a manner described below.

The program's curriculum

The senior curriculum is illustrated in Figure 1. One half of the class spends a quarter of the academic year assigned to medicine, a quarter assigned to surgery, a quarter divided between pediatrics and obstetrics and gynecology and has one quarter free. The other half of the class, that assigned to the General Medical Clinic,

spends two quarters of the year in the clinic, one quarter assigned to surgery, and has one quarter free. During the two quarters, or approximately 24 weeks, when the students are assigned to the General Medical Clinic, they are actually in the clinic five one-half days for 18 weeks and two one-half days for six weeks. It is clear that this scheduling makes possible a comparison of the effects of the experimental program, the General Medical Clinic, with the program organized along more traditional lines, which serves as a control.

The General Medical Clinic student is assigned both adult medical patients and pediatric patients; once assigned a patient he provides the necessary medical care for him throughout the entire six months. The student is given as much time as may be necessary for a complete work-up of the patient—usually one and a half to two and a half hours and an hour or more for each return appointment. He is closely supervised by a fairly large staff. An internist or pediatrician sees every patient with the student and in addition, he has available to him consultants in psychiatry, surgery, obstetrics and gynecology and many of the subspecialty areas of internal medicine as well as social service workers and a public health nurse. Thus, almost all problems that may arise can be handled by the student with the help of his consultants. Despite the rather close guidance of the staff the student is encouraged to develop a feeling of responsibility for his patients. Indeed, patient responsibility is considered to be a key factor of the educational philosophy of the clinic. This is achieved as a result of the student's opportunity to see his patients frequently and to serve as their physician—all advice from consultants, and wherever feasible, all medical care is channelled through the student to the patient. In many instances the student cares for several members of one family and he provides home care for at least one selected family. The home care is also closely supervised. Each student is also assigned two obstetrical patients, one in early pregnancy and one in late pregnancy. He provides prenatal care for them in the clinic under the guidance of the obstetrician, delivers the baby in the hospital and continues to follow the mothers and new-borns in the clinic. In addition, the student is assigned to other new-born babies at the beginning of his clinic experience so that he has maximum opportunity to participate in well baby care. A modified medical ward clerkship with part-time duty on the ward, concomitant with the clinic assignment for approximately 12 weeks, rounds out the student's experience —thus enabling him to see some of his patients in the clinic, the ward and the home.

Within the framework described, limited frequently by circumstances, the principles necessary for the practice of comprehensive medicine are applied. To us, the practice of comprehensive medicine implies that the physician or some member of his team of associates should attempt to provide, or assist in providing, everything that is necessary and feasible for his patient's health. It does not imply the provision of unnecessary services. We make no claim to the possession of unusual knowledge concerning the necessary conditions for health; we believe that any or all aspects of a patient's environment may be important in influencing his health and therefore may be the concern of his physician. A patient's emotional problems, his

reactions to environmental stress, his reactions to his disease, his reactions to his physician—all are frequently important and must be studied, understood and possibly modified. Social and cultural factors influence every patient's adaptation and, therefore, should be considered routinely by the responsible physician. Even when these environmental factors cannot be manipulated to the patient's advantage, an appreciation of them and their effects upon the patient is necessary for an appropriate understanding of the individual and his health. Consideration of these factors by General Medical Clinic students is made possible by the relationship between student and patient that is the product of continued contact over a long period, and augmented by the staff of instructors who encourage the students to practice comprehensive medicine. A more detailed description of our philosophy of comprehensive medicine has been published elsewhere.[2]

It should be stressed again that this broad interest in the patient and his environment must be coupled with an intensive study of fundamental medical concepts, facts and skills. There must be no sacrifice of the teaching of theoretical and empirical medical knowledge. Indeed, we feel that this teaching is made somewhat easier when the student is stimulated by patient responsibility.

The experience of the other half of the class, the control half, differs considerably from that of the students in the General Medical Clinic. The non-General Medical Clinic students are assigned for short periods of time to medical and pediatric clinics at another hospital, and to a number of medical specialty clinics. The length of assignment to the individual clinic varies from 3 to 8 weeks, one to four sessions per week. In addition they spend four weeks in a medical ward clerkship. Non-General Medical Clinic students are, therefore, not able to follow their patients long—a circumstance that could limit both the acquisition of medical knowledge and the development of a feeling of responsibility for their patients. Neither do they have readily available to them the skills of consultants in many disciplines to provide immediate advice in the various aspects of patient care. As is customary in university hospitals these limited specialty clinics are apt to focus their attention upon diseases of patients, rather than upon the total patient.

Formulating the research project

We turn now to the research problem. It will be recalled that the senior class was divided equally. (Students were assigned to each group at random and were roughly matched for class standing.) It was this division in the class which provided a unique opportunity for studying the effectiveness of the General Medical Clinic as an educational method. As a first step in the organization of the research project, the General Medical Clinic staff met with a member of the psychology department of the university, and together with an advisory committee made up of various interested members of the departments of medicine, pediatrics and psychiatry began to draw up the broad outlines of the project. The research design was clearly to be that of administering pre- and post-tests and comparing the performance of the experimental and control groups on a series of measures deemed relevant to the ob-

jectives of the General Medical Clinic.

It immediately became necessary, therefore, to describe in detail the specific objectives of the General Medical Clinic in order to assess the performance of the students relative to these objectives. The objectives were revised and clarified until they could be agreed upon by the clinic staff. The objectives of the clinic were classified into three areas—the area of medical knowledge in its traditional sense, the area of psychological components related to medicine, and the area of socio-cultural components related to medicine. The concept of comprehensive medicine is explicated, for these three areas demonstrate the extension of traditional medicine from within its usual limits to a study of man's interpersonal and socio-cultural environment and its influence upon him.

Each area is further categorized in terms of knowledge, skills and attitudes (Figure 2). Thus, with respect to the area of traditional medical knowledge, certain objectives were set forth relating to the acquisition of medical knowledge, the acquisition of skills in the application of this knowledge and the acquisition of certain attitudes toward the field of traditional medicine. Likewise with respect to the area of psychological components certain objectives were set forth in relation to the acquisition of knowledge, skills and attitudes. The same holds true for the area of sociological components. Thus, it may be seen that the General Medical Clinic is in principle concerned with objectives in nine broad areas.

The three main divisions

The research project itself has three main divisions and all three divisions are concerned with each objective (Figure 3). The three divisions are: Test Analysis and Development, Individual Differences, and Observation and Description. It is the responsibility of the Test Development section to prepare pre- and post-tests which measure differences between the experimental and control groups. Gain from pre- and post-test is one measure of the differential effectiveness of the two teaching programs.

It is the responsibility of the Individual Differences section to ascertain which students profit most from the respective programs, as well as

	Knowledge	Skills	Attitudes
"Traditional" Medical Components	Objectives i_1 i_2 etc.	Objectives j_1 j_2 etc.	Objectives k_1 k_2 etc.
Psychological Components	Objectives l_1 l_2 etc.	Objectives m_1 m_2 etc.	Objectives n_1 n_2 etc.
Sociological Components	Objectives o_1 o_2 etc.	Objectives p_1 p_2 etc.	Objectives q_1 q_2 etc.

FIGURE 2

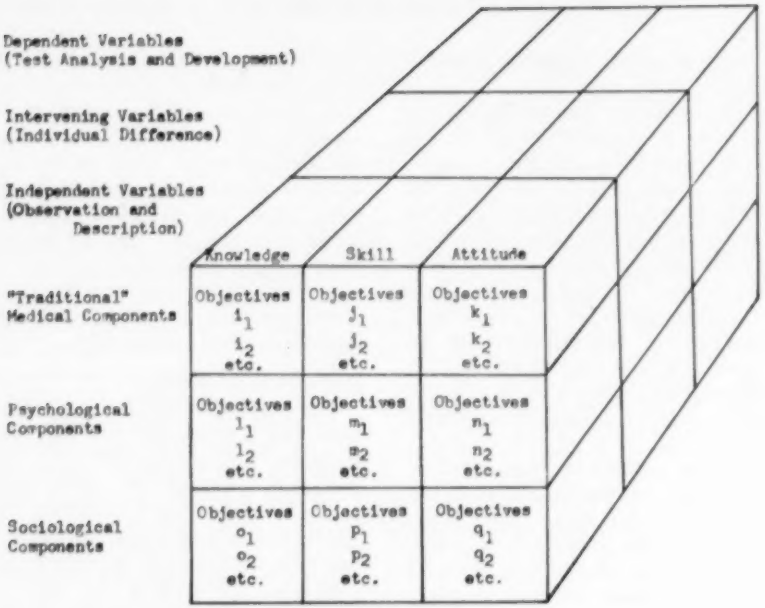

FIGURE 3

to determine, if possible, the characteristics of the students that are significantly related to performance.

Finally, no research project of this sort can omit a description of the two clerkships under study. Nor could we accept at face value a mere description of how the two clerkships should function. It is the responsibility of the Observation and Description section of the project to study and report objectively the differences between the two clerkships as they actually function.

Figure 3 also illustrates that not only are there nine broad areas of General Medical Clinic objectives, but that each division of the research program is responsible for providing information concerning each objective. Consider, for example, the objectives i. in the front left hand corner. One objective here is an obvious one—to increase the amount of medical knowledge acquired by the student. The Test Analysis and Development section of the research program is responsible for developing an adequate measure of medical knowledge, and then discovering which program (the General Medical Clinic or the regular medical-pediatric clerkship) is most successful in meeting this objective. This is done simply by comparing the gain on the pre-post test performance of the two groups on the medical knowledge test.

The same is true for objectives m. in Figure 3. Here the General Medical Clinic attempts to increase the student's skill in interpersonal relationships. Again, the Test Development section must develop measures of these skills, administer them before and after the students' medical clerkship experience and compare the performance of General Medical Clinic and non-General Medical Clinic students.

This also holds for objective q. The General Medical Clinic intends to inculcate an attitude of awareness and acceptance of the importance of

sociological factors in the problems of patient care. The Test Development section must find ways to determine whether attitudinal changes take place between pre- and post-tests and compare the experimental and control groups.

We already know, however, that not all students will profit equally from their education. It is the responsibility of the Individual Differences section to discover which students profit most. Moreover, this section is attempting to discover whether there are personality factors characteristic of the successful students and if so, what they are. This is especially important in connection with the possibility that students may be hostile toward the idea of comprehensive medical care as expounded by the General Medical Clinic and will, as a result, fail to profit from their experience as much as they should. It is important to identify and describe those students so that their reactions may be predicted, understood and possibly modified.

A further question remains; why did we obtain (or fail to obtain) certain results? This can be answered only by accurate observation and description of the techniques and processes of medical education in both programs. Only with adequate objective data can there be any understanding of the educational processes which lead one group rather than another to acquire more medical knowledge, if such should be the case. The acquisition of these data is the responsibility of the Observation and Description section of the research program.

The same questions are addressed to all objectives. For example, which group of students, General Medical Clinic or non-General Medical Clinic, acquires the most knowledge of interpersonal relationships, objective 1. What are the characteristics of the individual students who acquire the most and the least knowledge in this area? How are the students taught this material? Procedures have been developed to provide information in each section of the cube presented in Figure 3.

It will be apparent that the above research design is a rather ambitious one which led us to set up a five year project. The first year (1952-53) was given over to planning and making objectives explicit and susceptible to test. The second, third, and fourth (current) years were devoted to collection of data from the classes of '54, '55 and '56. The project results will be written up during 1956-57. The fact that data are available from three classes makes it possible to cross-check results. The importance of this feature cannot be overemphasized, for we have on more than one occasion been surprised by results, the validity of which could have been established only through cross-checking on a second or third class.

The research staff consists of a research director and three full-time research associates, each of whom is responsible for one of the sections of the project described above. Research assistants, as well as an IBM specialist, are also members of the research group.

Research techniques

Space prohibits a description of each of the many techniques used to measure changes from pre- to post-test, to provide personality and ability data, and to ascertain differences in the manner in which the experimental and control groups are taught. The number of measures obtained is large and the students

devote two days to each of three testing periods. Suffice it to say here that while a certain number of traditional techniques (such as questionnaires) have been used, innovations have been introduced which have provided new and dependable means of obtaining complex, yet objective data. Two such techniques can be mentioned here:

1. Thirty-six sound moving pictures were made of a physician interviewing a patient. This technique makes it possible to present the same patient to members of both experimental and control groups at once under controlled conditions. After viewing the moving picture, students are provided with a test booklet and certain tasks are required of them. From this procedure we derive measures of: a) medical knowledge; b) medical skill; c) psychological knowledge; d) skill in interpersonal relationships; e) knowledge of sociological factors related to medical practice; f) the amount of stereotyping of patient by student; g) the amount of difference seen by student between overt and covert aspects of patient's personality; h) attitudes toward patients. The value of this new technique to the research project is clear.

2. A second technique which properly can be termed an innovation was developed in order to meet the problem of describing the teaching efforts in the experimental and control clerkships. It was recognized that individual student-staff conferences comprise the crucial teaching situation in the senior year. That is, although the total experience of the General Medical Clinic student is unquestionably different from that of the control group student, it remains of utmost importance to discover in what manner the teaching which the student receives from his instructor in the experimental group differs from that which the student receives from his instructor in the control group. For this reason we have attempted to study the actual teaching process in the individual student-staff conference wherein the student presents a patient work-up to a staff physician. This is done in the following way:

The student-staff conference is recorded (with full knowledge by both participants). The content of the recording is then coded by two physicians associated with the research project (but not associated with either clinic). Once the initial coding is completed, these data are then analyzed according to a procedure which allows us to quantify certain aspects (e.g. organization) of the student's conception of the patient before the staff physician begins to teach him and the conception of the patient which the staff physician attempts to convey to the student. This procedure allows us to study in an objective and quantified manner the student's thinking as well as the staff's thinking with respect to both the organic and socio-psychological problems of the patient. Over 150 such teaching sessions have been recorded for the Class of '56 and a total of 210 recordings are anticipated for the academic year. Although this procedure has been employed for the Class of '56 only, present results indicate the utility of the measure is extremely high. So far as we know, this is the first attempt to study the actual teaching process (as contrasted to reports about it) in a medical school.

The reader should be reminded that the techniques mentioned above are only two among a large number of procedures used. Full details of the research will be presented in a forthcoming publication.

Since techniques for obtaining these data were not available in most instances, a great deal of research on procedures had to be done. All procedures have been repeatedly revised, and there is now evidence that many of them are providing data which are valid and reliable. It is important that all procedures must provide data which will be meaningful to those responsible for the educational program and which lead to decisions about the effectiveness of the General Medical Clinic.

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Una investigación sobre la enseñanza de la Medicina Comprensiva

El concepto de la Medicina Comprensiva no es nuevo. Ha sido enseñado por muchos médicos en muchas Escuelas de Medicina. Lo que se trata ahora de saber es si tal enseñanza puede, con éxito, ser incluída formalmente en el *curriculum* de los estudiantes no graduados. Y para ello es necesario preguntarse: 1) ¿Adquieren los estudiantes, por medio del curso de Medicina Comprensiva, nuevos y útiles conocimientos, habilidades o actitudes? 2) ¿Se obstaculiza con esa enseñanza el aprendizaje de datos y hechos científicos tradicionales? El autor, en el presente trabajo, se refiere a una investigación al respecto (que se llevó a cabo con la ayuda financiera del "Commonwealth Fund" de Nueva York) en la *General Medical Clinic* que la Escuela de Medicina de la Universidad de Colorado inició en 1953 con el propósito de enseñar a los estudiantes de cuarto año la Medicina y el tratamiento médico comprensivos. Dicha enseñanza tenía un carácter experimental y los resultados se debían examinar objectiva y críticamente. Para este fin los estudiantes de cuarto año fuero divididos en dos grupos, uno que seguía un programa organizado de acuerdo con la enseñanza tradicional, y otro que, asignado a la *General Medical Clinic*, participaba en el programa experimental, el cual ofrece, dentro de ciertos límites, todas las facilidades necesarias para la práctica de la Medicina Comprensiva. Ya que todo el programa descrito había sido planeado como un experimento, era necesario, para hacer un examen crítico de los resultados, poseer una detallada exposición de los objetivos de la *General Medical Clinic*. La mayor parte del presente estudio especifica esos objetivos, así como los métodos de investigación empleados para determinar los resultados. Tales métodos fueron revisados varias veces hasta que se lograron datos seguros, y éstos se darán a conocer en un próximo artículo.

* * *

Separatas de este artículo, en español, podrán obtenerse si son solicitadas por un mínimum de 25 lectores.

CORNELL

Some of the Problems and Satisfactions of Teaching Comprehensive Medicine

GEORGE G. READER

FOR OVER three years, since June 1952, there has been accumulating at Cornell a considerable experience in introducing a comprehensive point of view into the teaching of patient care. Associated with this experience, there have been both problems and satisfactions for those responsible for it, but in terms of the objectives set up when the course in comprehensive medicine was instituted, the overall results of this particular adventure in medical education thus far have been more than satisfactory. The first goal, that of exposing the Cornell medical student to a broad view of the complexities of patient care through an improved experience with ambulatory patients, has been attained and the further aim of altering student attitudes toward a greater appreciation of the total life problems presented by a patient appears to be within reach.

The Comprehensive Care and Teaching Program has been fully described elsewhere. Here it perhaps suffices to say that this program was devised to permit the fourth year student to follow patients in the clinics of the New York Hospital for a six-month period and to take carefully-supervised responsibility for their care. The present plan differs from the previous arrangement chiefly in allowing students contact with the same patients over a long enough period so that they may observe the results of treatment and become aware of more of the patient's problems than one or two visits allow. In this situation increasing responsibility may be given the student as his instructors get to know him better and recognize his developing maturity.

Two significant changes in educational policy were required to bring about the new venture: first, integration of fourth year medicine, pediatrics, psychiatry, and public health into a six-month continuum; and second, the addition to the outpatient department of a staff of full-time teachers together with part-time teaching consultants in surgery, psychiatry, rehabilitation and obstetrics and gynecology under a coordinated interdepartmental administration. Various teaching methods such as family care, home care, special seminars and conferences have been possible because of this framework and have contributed to broadening the student's view.

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Whether the course in comprehensive medicine induces in the student any changes in his fundamental attitudes or improves his basic skills to bring him closer to the ideal of being a good physician remains to be finally determined. The subject has been under constant study and may eventually be resolved, but the larger question of how long this training in the last year of medical school may effect the performance of the trainees may be actually impossible to decide. The internship experience, for example, may serve to counteract the teaching in comprehensive medicine. Certainly one must be exceedingly wary of concluding that because a teaching program works out as planned, students exposed to it ultimately become better physicians than those trained under some other educational philosophy.

As investigations into the effect of this teaching continue, it has in fact become clearer that there is little likelihood of being able to evaluate any educational program in absolute terms. Sociological research has already shed new light on the process of medical education, however, and insights contributed by such study may well prove of greater value to medical educators than confirmation or denial of the merits of a single course.

Satisfactory as the course has been thus far, teaching comprehensive medicine at Cornell has not been an entirely tranquil endeavor nor without incident. As one class has followed another, certain problems which appear to be generic to this kind of teaching have emerged and been identified, and some of these difficulties now appear to be well enough understood to be worth recounting. Sociological research has been of particular assistance in contributing insights into these problems and in the placing of them in proper perspective.

Attitudes of the student

During the first three years of medical school, most students develop a somewhat narrow view of the doctor's job. The important part of a physician's work appears to them to be an intellectual exercise involving scientific facts, measurable quantities, and predictable outcomes. A disease is perceived to be a clinical entity with a specific name that identifies it more or less completely, and a set of diagnostic criteria that allow it to be recognized wherever found. Modes of treatment are guaranteed to be effective by eminent authorities. Fortunate it is for the student's peace of mind that this is so! But contrast this happy and relatively secure situation with what confronts the student in the course in comprehensive medicine — and later in his practice.

There the physician is seen as a man attempting to weigh imponderables and as one continually trying to exercise judgement and discrimination among a number of poorly understood variables requiring a remarkable display of wisdom, not only in discrete clinical situations, but in human affairs in general. Disease, too, is at times found to be a complex of minor dysfunctions that rise up to overwhelm a patient, or seen in its first faint beginnings is often bewilderingly obscure. Many opinions are available on the most appropriate course of action, but one is quite different sometimes from another and occasionally no one course, even in retrospect, is seen as completely correct.

Social and psychological problems that patients present, too, often lack

definition, and the information that an instructor can offer in these areas compares unfavorably with the exactitude of chemistry or physiology. Much is known about sociology and psychology, but in applying their principles in clinical medicine one often finds them diffuse and of a lesser order of certainty than in the natural sciences. Gradually an empirical content will emerge from the study of patients, however, and eventually medical school teachers should be able to speak authoritatively about the proper psychological or sociological basis of a particular course of action.

There are still other frustrations for the student, too. Patients with chronic illness oftentimes gradually get worse regardless of what is done. If the student is acting as the physician, he may wonder if someone with more experience than he could not obtain better results, and he may seek desperately for the special consultant who has the answer that will turn the trick—and find there is no answer. Or he may eventually find that a patient has indeed improved but the improvement was so slow that he was not aware of it until several agonizing months had passed. Most difficult of all for the student, perhaps, is the patient who cannot accept the help that is offered to him and must slowly and painfully be brought round to a proper point of view about the doctor's, nurse's or social worker's recommendations.

All of this is a considerable challenge to the student, and not all students are capable of meeting it. Those who do well in accumulating facts and so stand high in the class by virtue of well-written examinations may have difficulty solving problems of real life or in relating easily to patients when that is essential to therapeutic success. Faculty colleagues often have looked suspiciously at a low valuation of a previously high-ranking student and may condemn the teacher, rather than the student who despite a retentive memory is inadequate in meeting the complex situations posed in the actual care of patients.

Teaching students to solve problems and to make decisions cannot be easily accomplished with didactic methods. The student is better led through the necessary mental processes by his instructor and should have an opportunity to arrive at decisions and to make judgements on his own. Socratic or non-directive methods of teaching, as well as actual experience, are effective, but may be anxiety-provoking for the student who may find no reassuring pages of new facts in his notebook, just when his worry about how he will perform the next year as an intern approaches a peak. He wonders if his teachers have kept him busy enough, suggests that frequent examinations be given, and otherwise expresses his fears. One student asked if a daily lecture on how to read the literature could not be given throughout the course.

Three distinct phases of student reaction have come to be recognized during the course in comprehensive medicine. In the first, lasting about two months, the students passively accept the experience as they have more or less passively accepted teaching all their lives. Considerable effort must be expended during this time to get active participation in group discussions and seminars. The second phase, lasting sometimes for several weeks, occurs about the middle of the semester, and is characterized by marked anxiety, frustration, and even resentment on the part of some students. It coincides with the realization that comes about this time

that some patients are not improving in spite of proper treatment and that others have failed to keep their appointments or otherwise flouted the doctor's recommendations. Students begin to complain that a poor type of patient is being selected for them, and it is not unusual to find that a "crock" turns out on analysis to be an unsatisfactory patient who does not fulfill the student physician's expectations. Discussion of social and emotional aspects of illness is poorly tolerated, too, and the cry is heard, "Too much sociology!" which usually means that social workers should be seen and not heard. The third phase is one of integration and growing self-confidence. There comes realization that although there may be more security in a full notebook, one can't learn to take care of people that way. A student may be heard to say, "I wasn't always happy during the course, but I can really face up to problems now, and I'm not afraid the patient will wonder if I really am a doctor."

Field notes

Dr. Renee Fox, a sociologist who has been a participant observer in the program, has accumulated some field notes which help to illustrate this point. These notes are abstracted from a series of interviews with two students and indicate these student's picture of what is happening to them. It should be noted that the guidance which was available was not fully utilized by the students, and instructors are actually inclined to be considerably more supportive than is indicated here. At each visit, the patient is seen by an instructor as well as by a student, but the student, nevertheless, looks upon himself as the responsible physician, as these cases demonstrate.

Case No. 1

"The set-up in clinic is a good one. Dr. ..... seems perfectly willing for us to carry on by ourselves as long as we feel adequate, and is ready to help whenever we ask for advice. That way we can take almost as much responsibility as we feel we can handle, and after all, the only way to learn is by having to make decisions ourselves . . ."

"I am carrying three patients in one of my special clinics. One is a Puerto Rican fellow with a long history of stomach trouble which gets worse every time he sits down and thinks about what a dirty deal his wife gave him. I am using a rather directive technique with him, attempting to alter his attitudes and living habits. It's still too soon to expect much in the way of improvement."

Sometime later he said:

"My Puerto Rican with the stomach trouble came in this afternoon, and again, I am discouraged by lack of results. I intend to talk with Social Service to see if I can't do something about his miserable life situation. If I were in the fix he's in, I think I'd have stomach trouble, too, and I'm afraid no amount of talking will relieve him."

And again later:

"The little Puerto Rican man came to clinic this afternoon and reported no improvement whatsoever. He is so restrained I can get very little information from him, but his stomach trouble is obviously related to a miserable life situation that I am powerless to change. In a last desperate attempt to do something to relieve the poor fellows symptoms, I gave him a prescription for Banthine with my instructor's consent.

And finally:

"I said goodbye to my patients today. The little Puerto Rican with stomach trouble broke my heart. He tried the Banthine I prescribed in desperation last time, but as soon as he went to bed he regurgitated some gastric contents into his mouth and had that horrible bitter Banthine taste in his mouth the whole next day. In a total of nine visits I have done that man no service at all. . . The case has taught me a valuable lesson, though, in that it is now easier

for me to accept lack of dramatic improvement in a patient with a poor prognosis. I think I realize more clearly now that in many cases one must settle for limited goals and not beat one's head against the wall trying to cure everyone in a few visits."

Case No. 2

"I saw Mrs. G's daughters and was dismayed to discover that she had not deloused them as I directed. Both heads were crawling with lice, and we had given the older child a note admitting her to nursery school, where she has undoubtedly spread her animals. This woman has caused me quite a bit of consternation. I can't get her to reduce; I can't seem to make her delouse the kids; and I don't know what I'm doing wrong. I have remained pleasant and sympathetic, but have applied strong urging and have registered disappointment (not wrath) at her failure to cooperate. . . . Somehow I feel that it's a little late for me to change my approach to the problem, and if this foolishness with the head lice continues, I shall have to be cautious indeed not to display my annoyance to her. Today I directed her to delouse this afternoon without fail, and not to send T. back to nursery school until her head is *clean*."

"The most frustrating patient for me to deal with is someone who has a potentially correctable situation, where I'm not making too much headway . . . because I feel as though I should be moving forward faster with the patient, and that it's only because I don't have enough skill that I'm not. A Lupus case, on the one hand—some fatal disease like that—doesn't frustrate me half as much; because I know there's nothing that can really be done for cases like that. So, I don't blame myself. If I were taking care of a pneumonia case, though, and the patient died, that would really be traumatic, because I would feel as though it was because I'd blundered. Mrs. G. represents just that to me. The reason I find her so difficult is that I feel that if someone else with more skill were handling her, he could get the pounds off her. . . " Upon further questioning, this student admitted that though "lots of other students find obese cases difficult, some of the others would say, 'So, she's fat. She won't reduce. That's her fault, not mine. . .'"

Later he reported to Dr. Fox:

"Mrs. G. is beginning to get on my nerves. I see her about every two weeks (not counting the times I see her kids). I've been trying to reduce her, and can't. She has lots of problems that I can't begin to solve. So, I just sat and listened to her for 45 minutes or so. She ended up by asking me how long I would be her doctor, and forced me to the realization that I hadn't appeared as intensely interested as I tried to. This countertransference can be a nuisance."

Still later he said:

"Mrs. G. phoned to say that she couldn't make it with the kids, and gave the secretary no reason. I'll bet the kids still have nits and she's afraid of my finding out."

At another interview:

"When I saw Mrs. G. with her kids, I just had my fingers crossed. The visiting nurse had scrubbed all three heads and given instructions for keeping the heads clean. There were still nits in both kids' hair, but the improvement was obvious. Mrs. G. couldn't stay to tell me her troubles because the kids were fighting and shrieking so loudly I couldn't hear her. So she left."

And finally:

"My last visit with Mrs. G. was relatively brief. She told me again what a louse her husband is, and discussed her plans for the future. . . Revisit, two months."

Dr. Fox comments:

In both instances, the student's continuous, responsible relationship to the patient exposed him to certain difficulties in managing his feelings as he dealt recurrently with the patient. In the case of the "little Puerto Rican with the stomach trouble," the student found himself "feeling with" the patient to an inordinate degree. In the case of Mrs. G., the problem was just the opposite; the student-physician had trouble in keeping his annoyance with her from showing.

Neither the case of the Puerto Rican nor that of Mrs. G. was as acute as clear-cut, nor as dramatic as many of the cases a student is likely to encounter during his clerkship on the

medical wards. Rather, they come closer to the "garden variety" type cases a student might encounter in practice—in their "part-of-every-day-life" quality, their ambiguity, the extent to which they entailed socio-psychological as well as physical problems, and in their relative chronicity.

In both cases the student-physician experienced serious discouragement over his failure to make progress with the patient's problems.

And in both cases the student-physician called upon ancillary medical personnel, in addition to his instructors, for help. (In Case No. 1, a social worker; in case No. 2, a visiting nurse).

In the case of the "little Puerto Rican," the student-physician found that an approved medication proved to have a negative effect on the patient.

"These two cases may be said to have contributed to the student's "medical maturation" in at least the following ways:

1) They afforded him the experience of taking continuous responsibility for dealing with every-day medical problems such as "nits," obesity, wife-induced stomach trouble. In the course of handling such problems, the student-physician learned a great deal about the human relations intricacies of difficulties of this sort—discovering how hard it often is to resolve such "simple" cases satisfactorily.

2) These cases played an important part in teaching the student-physician to set "realistic" prognoses. Like many a fourth-year student he began his semester in comprehensive care with the conviction that the doctor could be expected to "heal" or "cure" most, if not all of the patients he was likely to see on an ambulatory basis. The cases of Mrs. G. and the Puerto Rican man taught the student to "lower his therapeutic sights"—to set more limited goals in many instances, and not to expect every patient's progress to be rapid.

3) Continuity of care and responsibility also afforded the student important training in detached concern. Through a trial-and-error process he reached a point where he could empathize with the situation of his Puerto Rican patient, and still look at his case with greater dispassion and objectivity than he did at first. Though he never achieved an empathic relationship with Mrs. G., the student learned nonetheless to hold his negative feelings in check. In both instances, he not only learned to deal with the socio-psychological dimensions of his patient's medical problems without getting so "personally" involved in them; but he also came to look upon the intractability of such problems as not necessarily his "fault" or the patient's.

4) In both cases the student-physician called in ancillary medical persons as consultants. The visiting nurse, it seems, was able to give the student active help.

5) Finally, having the drug he prescribed for his Puerto Rican patient affect that patient adversely was an important learning experience for the student. For the first time, in the role of responsible physician, he was in a position to follow the effects of the medication he ordered for a patient, when that drug proved to have adverse consequences. Certainly this helped to prepare him for an experience he will have to face up to many time as a mature physician."

Each class differs somewhat in its response, and the present class thus far appears to have escaped phase II which may indicate that it is possible to provide sufficiently skilled support during the period of frustration that the transition to phase III is made more easily. It seems unlikely, however, that old attitudes can be abandoned without some "growing pains."

The final problem to be mentioned is that of communication. In a large medical center there are many people working quietly by themselves. News of activities from outside their own group may not reach them or is garbled in transmission. For coordination of services in the comprehensive care clinics constant effort must be expended, messages must be sent out again and again, new students and new staff must always

be informed of plans and ideas, and objectives must be constantly reiterated. It is not enough to set an activity going and leave it, the tendency to segmentation is too great. Meetings must be held and information disseminated until the whole center is made aware of what is being and still needs to be done. Conversely, however, as the word gradually spreads it gains momentum until the time comes when there is no turning back, because attitudes have been changed and values become established among many people throughout the whole medical community.

Categorizing results

Gratifications obtained in teaching comprehensive medicine need not be elaborately categorized. They are the same as all medical teachers experience: Seeing students grow in ability to think logically, watching them develop justifiable self-confidence in dealing with the uncertainties of clinical practice; observing their skill increase in helping patients to adjust to chronic illness and to understand and live with functional symptoms; and finally, knowing that some students have broadened their perspectives about health and disease and the place of man in his world. These satisfactions do seem to occur to a greater degree in association with the Comprehensive Care and Teaching Program than in other teaching experiences.

In closing, a brief case report of one patient who has served in the training of seven different students over the past three years will perhaps best summarize the functions of the Comprehensive Care and Teaching Program:

> J. T. is a 38 year old truck driver who has been known to have a duodenal ulcer for 13 years and actually had his first symptoms at age 19. He is married to a woman of 34 and they have two little girls, 8 and 3. Both Joseph and Mary are of Italian descent and have lived in New York City all their lives.
>
> Joseph was first admitted to The New York Hospital in September 1952 with tarry stools and weakness for two days. Eight 500 cc. transfusions were required to stabilize his hematocrit at 40, and he was discharged on a strict medical regimen.
>
> In November 1952 he had his first appointment in the General Medical Clinic with a student physician and in December, at the beginning of the new semester, was transferred to another student and again to another in June.
>
> He was well during this period and was seen first at two-week, than one-month intervals. In September 1953 he had a second hemorrhage and an active ulcer was demonstrated on G.I. series. Because it was recognized that the patient's personality made him a likely candidate for marginal ulcer after operation, medical management was continued. Psychiatric consultation at that time confirmed the impression of a characterological disorder with emotional immaturity, poor control of impulse and strict suppression of emotions.
>
> He remained well until May 1954 although he missed a number of appointments. At that time he again hemorrhaged and was scheduled for operation. He refused operation, however, and was discharged again on medical management. Since then he has been asymptomatic perhaps because he has more carefully followed the routine laid down for him by his student physicians.

This is the stark clinical outline. What points are to be made about it? First, there is the question of responsibility. At each visit of the patient to the student physician, an instructor reviews the patient's progress, and every two weeks the entire full-time staff reviews and discusses the whole problem. During the patient's hospital in-service admission

he is under the direct charge of the resident staff, but the student physician and one of his instructors make regular rounds on him. The student's assignment is to keep the man from bleeding or having pain while he is responsible for him, and whatever help is required to do this is available.

A psychiatric consultant saw Mr. T. on several occasions and in addition to a formal report counseled each of the student physicians about his management. The social worker and clinic nurse, too, see the patient at nearly every visit and have worked actively with other members of his family. The net effect is to present to the patient a united front, reinforcing the student-physician at every turn and yet maintaining a friendly and accepting relationship.

A second point is the question of how broad a view each student obtains? In dealing with this patient it was impossible not to be concerned with his life situation. It was evident that some relationship existed between his bleeding episodes and problems at home. Eventually this turned out to be a problem of gambling. He would take the household money and bet it on the horses, then in a wave of remorse eat to excess and have pain or bleed.

Family tensions also revolved around his dependence on his mother who lives nearby. At one point tensions became so great that divorce seemed imminent, but because the patient's wife and children were also cared for by the same student, the problem was seen in proper perspective and worked out successfully. Also, Mrs. T.'s back pain and overconcern for her children's bowel habits, also managed by the student physician, could be better understood in view of her husband's difficulties.

A third question is whether the student has only one or two such patients; is this his whole experience? No! Each student has about 40 different patients during the semester with a wide range of clinical problems.

Mr. T. has done well recently because his student physicians have given him good care and because information from their predecessors and from various members of the staff has been available to them. In the course of caring for him each student has had an opportunity to learn not only about the natural history of peptic ulcer, but also about the complex life situations which make it a chronic illness difficult to treat.

The course in comprehensive medicine appears to be a most satisfactory way for the student to learn the operational skills of being a practicing physician. True, the physician inevitably learns these things when he goes into practice for himself, but the essence of education is to see that learning takes place in a disciplined environment where the instructor can help the student to choose the best of several alternative courses of action. The Comprehensive Care and Teaching Program has recreated some of the stresses of practice in an academic setting where guidance and support are possible while learning takes place. It is perhaps superfluous to point out that motivation for learning scientific medicine is enhanced in these circumstances at the same time that, for at least a few students, a broad perspective is inevitably induced, and that to accomplish this end it is not necessary either to add hours to the curriculum or to displace traditional subject matter.

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Algunos problemas inherentes en la enseñanza de la Medicina Comprensiva

Desde 1952, Cornell University está acumulando valiosas experiencias relativas a la enseñanza de la Medicina Comprensiva. Se ha hecho un estudio detallado de los problemas y dificultades a que dió lugar, durante el período de experimentación, el nuevo método de enseñanza.

Durante sus primeros tres años de estudios, el estudiante de Medicina suele desarrollar conceptos algo estrechos en cuanto a su futuro oficio. Este, para él, consiste sobre todo en una serie de ejercicios intelectuales que envuelven hechos, cantidades medibles y resultados previstos. Las enfermedades aparecen como entidades clínicas, con nombres específicos que las identifican. El curso de Medicina Comprensiva sirve para cambiar radicalmente tales conceptos, y suscita, naturalmente, ciertas reacciones por parte de los estudiantes. Estas, como se ha podido observar, muestran en general tres fases distintas: La primera, que suele durar unos dos meses, cuando los estudiantes parecen aceptar pasivamente las nuevas experiencias, y en la cual es necesario un esfuerzo considerable para lograr su participación activa en las discusiones de grupo y seminarios. La segunda fase, que se inicia a mediados de semestre y dura a veces varias semanas, es caracterizada por angustia, frustración y resentimiento, pues coincide con las dificultades que los estudiantes encuentran en su práctica clínica, dificultades que hacen se pongan en duda sus antiguos conceptos sobre enfermedades y tratamientos. Durante esta fase, se nota una marcada resistencia a toda discusión de los aspectos sociales y psicológicos de las enfermedades, que se puede resumir en el grito de protesta de "¡demasiada Sociología!" La ultima fase es un período de integración y de creciente seguridad en sí mismos. El autor se vale de las notas de Dr. Renée Fox, sociólogo que participó como observador en el Programa de Medicina Comprensiva, así como de un breve informe sobre un caso clínico determinado, para ilustrar cómo se presentan y se resuelven en la práctica ciertos problemas básicos inherentes al nuevo método de enseñanza.

COLUMBIA - PENNSYLVANIA

Studies in the Sociology of Medical Education*

ROBERT K. MERTON, SAMUEL BLOOM and NATALIE ROGOFF

IN ITS restricted form, the sociology of medical education centers upon the nature of the social and psychological environment constituted by the medical school and the bearing of that environment upon the acquisition of knowledge and skills and of attitudes and values by medical students. In its broader scope, it also includes systematic study of the external pressures operating upon the medical school itself—the changing health requirements of the society, the expectations and demands of the profession.

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at large, and the advances in the basic sciences and arts of medicine. But whether considered provisionally as a self-contained system, with its own internal processes of organization and change, or as part of a wider social system, the medical school is plainly the most critical phase in the making of the medical man.

In another publication,[7] we examine at some length the convergence of forces at work in the field of medicine and in the field of sociology which have apparently led to the recently emerging interest in the systematic study of medical education conceived as a social process. Here, it may be enough to mention one of these developments which has served to precipitate interest in such research: This is the appearance of a cluster of innovations in medical education which, although of varying degree, kind and scope, all call for the comparison of educational objectives with the actual outcome. To be sure, most medical schools are constantly engaged in developing their courses of instruction. But it is especially when these involve program changes of some considerable magnitude, when they constitute what Dr. Berry has described "as provocative experiments . . . aimed at making revisions in our teaching programs which are consistent with a growing knowledge of the whole patient rather than just a part of the patient,"—it is principally in these cases that there understandably develops a particular interest in methodical observation of how these institutional changes are actually working out.

Thus, when the faculty of the School of Medicine of Cornell University construed its Comprehensive Care and Teaching Program as "an experiment in medical education," they set about almost at once to collaborate with sociologists in a study of the operation and educational results of that program. This work was begun in the spring of 1952 and shortly thereafter, a conference was held in which members of the medical faculties of Cornell and of Colorado, also engaged in developing a program of teaching in comprehensive patient care, met with sociologists from Columbia University and psychologists from Colorado to advance their plans for studies of these innovations. So, too, the Western Reserve Medical School has from the beginning considered it an essential part of their basic reorganization of the curriculum to provide for continued study which would in due course permit evaluation of the new curriculum.* And for much the same reasons, the School of Medicine at the University of Pennsylvania undertook, some two years later, to collaborate with a group of sociologists in a study of the processes of learning among their undergraduate students.**

There is plainly not the time here to describe the details of the research developed during the past three years. We can only briefly indicate, first, the general tenor of the con-

*For a short account of the emergence of these programs of research on educational process at Cornell, Colorado and Western Reserve, see 9. As stated there, although each of these schools is engaged in its own program of research, provision is made for periodic pooling and comparison of experience. In addition, the Columbia University Bureau of Applied Social Research is collaborating closely with the research groups at Cornell, Western Reserve and the University of Pennsylvania, under a grant-in-aid from the Commonwealth Fund.

**For an account of the beginnings of the study, see 6. Most recently, plans are being developed for related studies at the University of Kansas Medical School under the direction of Professor Everett C. Hughes, of the department of sociology, University of Chicago, and at Albert Einstein College of Medicine of Yeshiva University, under the direction of Dr. Bernard Kutner, of the department of preventive and environmental medicine. Other independent research dealing with special but related problems is underway in the schools of medicine at Yale, Iowa and Buffalo, among others.

ceptions and assumptions governing these studies, second, the character of the data now in hand, and third, a few illustrative findings. The details of these studies will be set forth in a series of periodic reports.

The conceptual framework

As has been indicated, we conceive of the medical school as a social environment in which the professional culture of medicine is variously assimilated by students through discoverable social and psychological processes. The school is regarded as a decisive middle term between the prior orientations and trained capacities of selected individuals, and the emergence of 'the professional self,' the identification of these individuals, by themselves and by society, as medical doctors. It is our most general objective to find out, in some detail, how this happens: how these aspirants, with their abilities, anticipations, fears and hopes emerge as institutionally certified physicians, outfitted with a characteristic definition of their role (*i.e.* what it means to be a doctor), with attitudes toward that role (*i.e.* a disposition to regard some parts of the role as indispensable and others as secondary), with a self-image (an appraisal of how they measure up to the requirements of the role) and with a set of professional values (relating their role as physicians to others in the community).

This general orientation involves numerous specific guide-lines to inquiry. For example, the concept of education as a social process directs attention to those parts of the environment constituted by medical schools which confront students with particularly difficult and perhaps abrupt transitions from one set of attitudes and behavior to a significantly different set. Such critical transitions are thought of as *discontinuities* in the acquisition of the professional role, creating problems with which the student must somehow cope. Medical education of course requires that the student adopt a succession of roles, in the laboratories and the clinic, in the hospital and sometimes in the patient's home. This concept of what we describe as *critical zones of discontinuity* has in effect been identified by Whitehead when he observes that "qualities essential at a later stage of a career are apt to be stamped out in an earlier stage." In application to the medical school, this requires us to uncover the places, if any, in which the student is confronted with such discontinuities and his responses to the marked, sometimes abruptly changing, demands made of him.

Similarly, we are engaged in studying the formation of students' professional and life goals during the course of their education. What difference, if any, does it make to the nature of their learning if students decide, relatively early rather than late, to work in a particular specialty? How does it affect their present interest in various parts of their medical education, their identification with some rather than with other members of the faculty? In this far from paradoxical sense, there are indications that the (anticipated) future may govern present behavior.

These few remarks can at best barely indicate the direction of our inquiries. Furthermore, we find that actual experience requires us to temper these general research objectives to the realities of the situation: we have had to prune our studies at more than one point, and to extend them at others. Nevertheless, these conceptions serve as a guide

for separating the relevant from the irrelevant, for studying the interdependence between several parts of the medical school regarded as a social system and, above all, for conceiving medical education, not only in its obviously basic aspect as the transmission of technical skills and knowledge but also as the transmission of the culture of medicine, with its characteristic attitudes and values, goals and perspectives, these being linked with the society in which medical care takes its place as a major institution.

Nature of the data

To study the development of medical students in these terms, we have adopted a longitudinal research design—what sociologists call a panel study[4 11]—in which students are followed through their four years of undergraduate training. Our studies have so far been confined to the undergraduate years although, in principle, they could be extended to follow these same students through their successive roles as interns, residents and practitioners. In this way, it would be possible to relate the numerous data we have about their development in medical school to their work as medical practitioners and so gain some insight into the longer-run and not merely the short-term effects of their education.

The basic data in hand, though not the exclusive data, consist of annual soundings of students' attitudes, experiences, expectations and scale of values, these being obtained through the use of standardized questionnaires taken by students at the end of each academic year. At this telling (as can be seen from the following chart) we have such comparative data for 1700 students, at various stages of their training at Cornell, Pennsylvania and Western Reserve.* By use of the longitudinal or panel design, we are tracing the development of students' attitudes, values, social relations and career plans and relating these to various and successive evaluations of their performance by the faculties of these schools. Until now, one class has been traced for a period of three

*We gratefully acknowledge the continued collegial assistance given us by the students, faculties and administration of these schools, and particularly by the following: at Cornell, Dr. Joseph C. Hinsey, Dean E. Hugh Luckey, Dr. David P. Barr, Dr. George G. Reader; at Pennsylvania, Dean John McK. Mitchell, Dr. Kenneth E. Appel, Dr. John P. Hubbard, Dr. William B. Kennedy; at Western Reserve, Dean Joseph T. Wearn, Dr. T. George Bidder, Dr. John L. Caughey Jr., Dr. Thomas Hale Ham, Dr. John W. Patterson.

QUESTIONNAIRES ON ATTITUDES AND EXPERIENCES OF MEDICAL STUDENTS

Status in Medical School	No. of Students	CORNELL Class of: '52	'53	'54	'55	'56	'57	'58	PENNSYLVANIA Class of: '54	'55	'56	'57	'58	'59	WESTERN RESERVE Class of: '54	'55	'56	'57	'58
Entering first year	535											x	x	x				x	x
End of first year	737				x	x	x	x				x	x					x	x
End of second year	715			x	x	x	x				x	x					x	x	
End of third year	752		x	x	x	x				x	x					x	x		
End of fourth year	759	x	x*	x*	x*				x	x					x	x			
Number of years intervening between first and last questionnaire:		--	1	2	3	2	1	--	--	1	1	2	1	--	--	1	1	2	1

*Additional data for each of these classes were obtained midway between the beginning and the end of the fourth year. At this point, one-half of the students had completed their work in the Comprehensive Care and Teaching Program, while the other half was just about to enter the program.

TABLE 1

Percentage of Medical Students who regard Contact with Patients as Providing Occasions both for Learning Medicine and for Helping Patients*

Status in Medical School	School A	School B	School C
Before beginning medical studies	—	61%	65%
End of first year	69%	52%	65%
End of second year	51%	35%	43%
End of third year	56%	46%	57%
End of fourth year	67%	59%	61%

*The question read: "Do you look upon your contact with patients primarily as an opportunity to learn medicine, primarily as an opportunity to help patients, or as presenting equal opportunities to learn medicine and help patients?" Almost no students selected the second alternative.

Percentages reported are composite averages for all students in the given class and school. At one school, there were four distinct sets of reported attitudes; at the other two schools, two sets each. The pattern is the same in seven of eight distinct sets of data; in one, the lowest proportion occurred at the end of the third year rather than the second.

years; four classes for a period of two years and eight classes for a period of a year. We have, also, comparable data for five classes of students just before they began their medical education. And finally, we have interim observations, at six-month intervals, designed to provide comparisons between groups of fourth-year students at Cornell before and after they have received training in comprehensive medicine.

This summarizes the data in terms of the length of time we have so far been able to follow particular groups of students. Looked at cross-sectionally, that is, at one period in time, the basic data pertain to eight distinct classes in each of the four undergraduate years. Four of the eight are at Cornell, two at Pennsylvania and two at Western Reserve.

A few examples may serve to sketch out some of the potentialities and limitations of the materials available in the shape of this research design.

1. Inter-school uniformities: First, by comparing the distributions of attitudes of students as they move through each school, we can identify those patterns which are *common* to the three schools (and which may turn out to be common to a wider array of medical schools). We can also identify *sequences of change* in attitudes and values which seem to occur uniformly under all the differences that otherwise distinguish one school from another.

For example, as medical students move from one year of training to the next, they exhibit a marked and recurrent trend in attitudes toward their relationship with patients. The data summarized in Table 1 show that just before they begin their medical studies, a large proportion of students look upon their prospective contacts with patients not merely as occasions for learning medicine but also as occasions for providing help to the patient. In all three schools, this proportion declines to a substantial though varying extent during the first year of training and reaches its low point by the end of the second year. Thereafter, this conception of the patient (as a person in need of medical care as well as an occasion for learning) rises successively in the third and fourth years until it reverts to approximately the same high level of patient-

orientation which obtains among prospective students before they have undertaken their medical studies.

This example, drawn from a larger array of similar cases, may illustrate the respect in which it is possible to identify a definite sequence of net attitude change* on the basis of comparative data for several schools. The reported trend is based, not on the possibly idiosyncratic sequence observed among one group of four classes in one school, but on eight distinct classes in each of the four years of training and on three classes of students about to begin their training.

2. Inter-school differences: Second, and by the same token, we can identify *differences* in the climate of student attitudes and values in the three schools. Western Reserve, for example, has taken numerous steps to minimize the sense of competitiveness among students (by reducing the number of graded examinations, by arranging for sustained and close contact between each student and members of the faculty and by other organizational changes designed for the same purpose). As it happens, these changes were introduced into the early years of training just before we began our observations, so that comparisons before and after the change are not possible. But we can compare the perceptions of the amount of competition encountered by first- and second-year students studying under these new arrangements at Western Reserve with the reports by comparable students at the other schools. The comparisons show that considerably more of the students at Western Reserve, which introduced these specific innovations, found little or no competition among the members of their class (54 per cent at Western Reserve, compared with 18 per cent and 16 per cent at the other two). We are now engaged in analyzing the data further to see if the appreciably different climates of student competition are associated with differing degrees of stress experienced by students and how these in turn relate to the faculty's evaluation of their performance.

(Parenthetically, we should note that a comparable study of a law school finds a much more intensive sense of competition among first-year law students than is found in any of the medical schools under review—a negligible 4 per cent reporting little or no competition.[10])

3. Intra-school comparisons: To this point, we have indicated certain possibilities of inter-school comparisons, both by way of uncovering uniformities of social environment, attitude formation and learning common to the three schools and of uncovering those which are distinctive of each school. These inter-school comparisons, however, are collateral to the central purpose of our current studies, the major focus being rather on comparisons among various types of students and learning situations *within* each school. This third use of the data involves, among other things, continued study of the educational innovations at Cornell, Pennsylvania and Western Reserve.

The Cornell Program of Comprehensive Care and Teaching, for example, is now in its fourth year of operation and has been under sociological observation from the beginning. As experience has accumulated, there have been changes in the Program. The longitudinal or panel research design presently includes observations of six groups of fourth-year students before and after they

*More detailed analyses of the types of students who do and do not exhibit such changes are now in progress.

have completed their six-month cycle of work in the program, and this provides a basis for identifying at least some of its short-run effects. It will therefore be possible to indicate the extent to which the major objectives of the program have been variously achieved at successive stages in the history of the program. For a case in point, we can return for a moment to the matter of students' attitudes toward their contacts with patients. The data show that, in its first year of operation, the program appreciably increased the proportion of students who look upon these contacts as presenting opportunities to help the patient as well as to learn medicine. As we have noted, and see again from Table 2, there is a growing tendency for students in their fourth year to regard contacts with patients as having this double purpose. But the change in this direction among the group of fourth-year students who were trained in comprehensive medicine was substantially greater than that found among their classmates who had yet to enter this program of training.[2] Analyses now in progress are directed toward finding out if this pattern of changing attitudes toward patients has persisted as the program moves into its fourth year of operation or if it has changed in magnitude or direction.

In the same way, the new curriculum at Western Reserve and the Family Health Advisor Service at Pennsylvania have been in effect for varying periods of time. Historical changes in the educational and other effects of these programs can, in principle, be detected by comparing successive classes studying under them. Our study at Western Reserve, for example, began when first and second-year classes were studying under the reorganized curriculum and upper-class students were still under the old. By now, we have data on third-year classes who have been trained under the new and the old curricula, allowing us to make provisional comparisons between the two. For example, to consider again the matter of student-competition. By the end of their third year, the last class to study under the old curriculum had 55 per cent reporting that they had experienced a great deal of competition among their classmates. Among the first third-year class under the new curriculum, this proportion drops abruptly to a negligible 9 per cent. In much the same way, we are engaged in comparing the changing experiences and attitudinal learning which have been occurring in the Family Health Advisor Service at Pennsylvania as this program moves into its seventh year of operation.

TABLE 2

Percentage of Medical Students who regard Contact with Patients as Providing Occasions both for Learning Medicine and for Helping Patients (before and after training in Cornell CC&TP)

	May 1952		December 1952
Students about to enter CC&TP	45%	Students completing CC&TP	74% (N = 42)
Students about to begin courses in Surgery, Ob.&Gyn. and elective	50%	Students completing courses in Surgery, Ob.&Gyn. and elective	58% (N = 40)

As we have intimated, the panel design provides the basic data for tracing the development of students in the course of their training. These systematic data, which lend themselves to statistical analysis, are supplemented by other, more qualitative, materials. Two sociological observers—Renée Fox at Cornell and Samuel Bloom at Pennsylvania—have devoted the greater part of their time to continued observations of interrelations of students, patients, faculty and other health personnel in their usual, that is to say, their social, setting.* Four students in each year of training have kept daily journals of their experiences; and these personal documents which, like all the materials, are of course held in full confidence by the research group, have greatly helped us to interpret the systematic panel data and to suggest supplementary types of inquiry. Weekly interviews with these students, focused on experiences which have been only briefly touched upon in their journals, have proved particularly instructive.

On the basis of such observations and documentary materials as well as of lecture notes and laboratory syllabi, Dr. Fox is well advanced in preparing what might be called "a sociological calendar of the medical school."[1] This is a detailed chronological account of the important didactic and attitudinal learning that takes place in the classroom and outside of it, so far as we have come to understand these processes. When completed, it will provide a provisional overview of the major sequences of learning which we have thus far identified and will be, we trust, of interest to the medical educator as well as to the sociologist interested in the formation of attitudes and values.

And finally, our data are being continuously correlated with the recorded appraisals of student performance by members of the faculty.[8]

This account of the character of the data, general as it is, may be enough to provide the basis for a short review of selected findings.

Illustrative findings

The few illustrative findings considered here can be grouped under four major headings in terms of sociological variables which have been found to affect the development of students into physicians. These are first, the socio-economic status of students; second, the patterns of social relations in which students are involved; third, the self-attitudes and self-images which they develop; and fourth, their attitudes toward patients, toward the profession of medicine and toward its component specialties. (There is plainly no possibility, in this limited report, of dealing at length with these or of considering other significant variables at all.)

1. Socio-economic status: Medical school of course represents more of a financial burden for some students than for others. It is also apparent that students differ in the extent to which they bear some of this burden themselves, or are fully dependent upon their families for economic support. Students who are thus completely dependent upon their families and who report that these expenses are a serious drain on their families' resources appear to approach their medical school career somewhat differently than their classmates. For one thing, we find that they are considerably more doubtful than the others about their decision to study

*Field observation, particularly of preceptoral groups, is being independently conducted by Dr. Milton J. Horowitz at Western Reserve.

medicine. Once having undertaken what is for them a more stressful decision, their orientation toward academic work also appears to be affected by their dependent status. For example, many more of these highly dependent students feel that it will be necessary to "put aside everything but their studies" if they are to achieve high academic standing.

This tendency to focus exclusively on their studies is interestingly corroborated by a still provisional finding in connection with one of the innovations established as part of the Western Reserve revision of curriculum. This is the introduction of scheduled periods of free time which students can autonomously devote to any of a wide range of activities. The faculty knows, of course, that some students use this time effectively, others less so. But the conditions making for such differences may not always lie so close to the surface as to be immediately apparent. First indications are that, to a considerable extent, this scheduled free time is being utilized, as the innovators of the plan hoped it would, to augment and extend the learning beyond that which takes place in courses. What we want to consider here, however, is the use of this time not by students at large, but by students of differing socio-economic origins. And here we find a considerable and significant variation: the greater the financial pressure under which students find themselves, the more do they tend to devote this time to further intensive preparation for examination and to study of prescribed subject-committee materials, rather than to autonomous work on a research project, observation in hospitals, supplementary reading of medical journals, and the like. It is as though the acute financial pressure induces a strong need for assurance that they will meet the requirements of courses, rather than allowing the expression of interest in wider ranges of medical experience (or even of recreation). Since it is based upon the analysis of only one class thus far, this finding must be considered particularly tentative. But it may serve to illustrate the hypothesis that the same program of instruction can have significantly differing meanings and involve different kinds of participation by students who find themselves in disparate economic circumstances.

To judge from other data, the socio-economic status of students also affects their orientations toward the profession of medicine and their conceptions of their probable future when they will have entered upon medical practice. We find, for example, that the type of practice preferred by students in their last three years of training at Pennsylvania is much the same, irrespective of their socio-economic status. At all levels, a little over a third prefer general practice, about half prefer to practice one or another specialty, and the remaining 10 per cent prefer teaching and research. The picture changes appreciably, however, when the students report, not their preferences, but what they consider to be their realistic expectations. The lower the economic status of students, the smaller the proportion wanting to enter a specialty who expect actually to do so. We are continuing our analysis of the data to see if the belief that their professional hopes will probably be frustrated affects their current learning.

But not all differences in initial attitude and expectation among students of differing socio-economic status persist. Some tend to become

ironed out as students move through the environment of attitudes and values provided by the medical school. One example must serve in place of many. When they first enter medical school, students from the lower economic strata tend to have considerably higher expectations of the income they can reasonably expect from their future practice than do their more advantaged classmates. Furthermore, we know from other data in hand that the economic expectations of students tend to rise as they move from one year to the next in medical school. But the extent of these rising expectations varies for the different strata of students, so that by the end of the fourth year, the difference between them wholly disappears: about 40 per cent of students from each stratum expecting to have an annual income of at least $15,000 after they have been in practice for ten years or so.

These few examples can of course only illustrate the more general conclusion to which the data have tentatively led us: the socio-economic status* of students affects, with appreciable regularity, certain of their orientations toward the profession, the formation of certain attitudes and values, and patterns of study. However, we have yet to distinguish the types of attitudes, aspirations, performance and plans which do differ for students of differing socio-economic origins from those which differ at the outset but are then levelled out in the medical environment, and finally from those which are not at all affected by social origins.

2. Patterns of interpersonal relations: Just as social and economic origins play a part in the academic work, formation of attitudes and orientations of medical students, so, we find, do the patterns of interpersonal relations which obtain among them. We report two instances illustrating this general observation: one, based on interpersonal relations among students at the time they enter medical school and shortly thereafter; the other, on their relationships during the last three years of undergraduate medical study.

As is probably well known to the faculty and administration of medical schools, entrance into the school is typically a group experience rather than an individual experience. That is to say, the great majority of each new class have friends who are entering at the same time. Moreover, many have friends in the upper classes. Our first findings suggest that there are distinct differences in the ease of adjustment to what is for many students a stressful situation depending on whether they enter as lone individuals, with friends in their own class, in upper classes, or in both.

At Pennsylvania, for example, incoming students with friends in the upper classes are far more likely than the rest to feel reasonably well oriented toward the school. They know what to expect. And having this sense of orientation, they tend, in turn, to be appreciably more confident that they will do better-than-average work during their first year of study. We are analyzing further materials to see if the prior orientation which makes for self-confidence actually results in superior academic performance.

*Systematic comparisons between students who are the offspring of physicians and students of other occupational origins promise to be instructive in their own right. Almost identical percentages of students in the three schools come from families of physicians: 19 per cent in the Cornell group, 20 per cent at Pennsylvania and 18 per cent at Western Reserve. In some respects, it appears, their initial orientations and their subsequent development are quite distinctive.

The advantaged position of students who enter school with friends is further suggested by observations in what is generally conceded to be the most stressful situation during the first year: the anatomy laboratory. At Pennsylvania, again, we find that to a significant extent, friends tend to become partners at the dissection table. And the more college friends they have as partners, the higher the quality of their work (as this is rated by their anatomy instructors). This is one among several findings which suggest that it is not merely abstract intelligence or aptitudes as such, but these as they work out in particular kinds of socially patterned situations which greatly affect the character of academic performance and learning.

Much the same pattern is found among the upper classes of students. Present indications are that the greater the number of close associates a student has in the school, the higher his academic standing, as registered by his cumulative grades.[5] In part, of course, this may be a result of high-ranking students being sought out by others. But in part, also, if we can judge from other evidence in hand, it means that students who have the psychological support of close associates are better able to realize their capacities for learning.

3. Self-images and self-attitudes: Throughout these studies, we have assumed that the conceptions which students have of themselves as physicians-in-training will significantly affect their development. As would be expected and as the data confirm, in the course of moving from the early to the later years of undergraduate training, a growing proportion of students see themselves as physicians rather than as merely students in their dealings with patients. But the double fact that not all students exhibit this change in self-image and that an appreciable number form this self-image in the early years of medical study raises two broad questions. How do these self-conceptions come about and how do they affect the pace and character of students' subsequent learning of medicine? The first of these can be briefly considered here; the second is now being investigated.

Confining ourselves at the outset to the first-year students in the new curriculum at Western Reserve,[3] we find that this image of themselves as novice-doctors varies greatly according to the social context in which the students are involved. Vis-a-vis their peers and members of the faculty, a negligible two per cent see themselves as physicians: vis-à-vis nurses, there is a perceptible increase but in relation to patients, fully one-third of the students, even as early as the end of the first year of training, tend to see themselves in the role of a physician (albeit with clearly delimited responsibilities).

What contributes to the formation of such self-images among some students but not among others? As most of us know, it is a practice at Western Reserve (as at Pennsylvania*) to provide students with the opportunity for fairly sustained contact with patients in the role of a quasi-physician, involving limited and supervised responsibility for helping a family cope with their medical and correlated problems. Chosen for such assignment are families in which the wives are pregnant; students are expected to observe the patient during the course of pregnancy, the delivery and the early infancy of the child. How is

*A detailed report on the Family Health Advisor Service at Pennsylvania is being prepared by Samuel Bloom and is therefore not reported in this paper.

the formation of a professional self-image affected by this opportunity to bring some peripheral medical skills into play and, more importantly, to develop a sustained relationship with the patient? Each student deals with only one family, there can be wide variation in the problems families present. We find that it is the occurrence of definite medical problems in the family with which the student helps them deal which substantially increases the probability that he will develop the image of himself as a physician. And finally, as the statistics show, it is when these problems are not unduly great, when students find that the requirements of the assigned task do not outrun their still quite limited knowledge and skills, that they are most likely to develop this self-image.

We should note, in passing, that much the same process in the formation of self-images was identifiable, on a more advanced level, among fourth-year students in the Comprehensive Care and Teaching Program at Cornell.[2] Experience in the program, with its distinctive arrangements for continuing relations with patients, greatly increased the proportion of students, nearing graduation, who saw themselves as physicians. And preliminary statistical analysis indicate, it was most particularly the experience involved in home visits that tended to produce this result.

Mutual confirmation of the data from two schools lends some measure of support to the findings in each.

4. Social attitudes: Did time allow, it would be in point to examine findings on the formation and consequences of students' attitudes toward various types of patients, toward selected programs of instruction, toward the profession and its component specialties. It is plain that even a preliminary report on these matters must be postponed.

But perhaps one short example may show that some of these attitudes and evaluations, which are remarkably stable in their distribution in all four years of training and in all three schools, can be usefully thought of as comprising the professional subculture within which students make their own career plans. For instance, great uniformity is shown by medical students at each stage of the four-year undergraduate sequence in their conceptions of the relative prestige granted by the profession at large to the various specialties and types of medical work. (Since the three schools present almost identical sets of evaluations, we report only the composite rankings.) First- and second-year students consider that the fields are ranked in the order shown in Table 3, p. 564.

Students in the third and fourth years are in complete accord with these ratings except in one respect: for them, the relative standing of surgeons shifts from first to third position.

From interviews, journals and observation, it becomes evident that the decisions which students must make with respect to their careers take place within the context of these prevailing evaluations of the various types of practice in the profession. We shall attempt to find out how this scale of evaluation affects the student's ultimate choice of his own career. How does it happen, for example, that some students plan to enter a field of practice which, in their own view, has a relatively low standing in the profession: what conflicts result from such decisions and how do students cope with them?

TABLE 3

Students' Perceptions of the Relative Standing Assigned to Medical Fields by the Profession of Medicine

First-and Second-Year Students	Rank Order	Index of Prestige*	Third-and Fourth-Year Students	Rank Order	Index of Prestige
Surgeons	1	4.27	Professors in a medical school	1	4.18
Professors in a medical school	2	3.93	Internists	2	4.10
Internists	3	3.91	Surgeons	3	4.00
Pediatricians	4	3.56	Pediatricians	4	3.43
Obstetricians	5	3.50	Obstetricians	5	3.39
General practitioners	6	3.34	General practitioners	6	2.99
Psychiatrists	7	2.82	Psychiatrists	7	2.62

*The index was constructed as follows: Students selected one of five levels of prestige to describe their judgment of the reputation of each of the medical fields. The prestige levels were assigned values ranging from 1 to 5. The index is a weighted average of the distribution of each set of ratings, and varies from a minimum of 1.0 (all students agreeing that the field is in the lowest prestige category) to a maximum of 5.0 (agreement that the field is in the highest category).

What sorts of compensations—intellectual, humanitarian, economic—do students expect from working in a field that does not carry high prestige? Does a prior sense of commitment to a specialty heighten its status in their own eyes and if so, how do they insulate themselves from the lower status presumably ascribed to this specialty by the profession? Does it turn out that the students who have the greatest doubts about being in medicine at all tend to make their choices in terms of the reputations of the various fields of practice?

Although questions of this order have yet to be systematically explored, we believe that substantial progress can be made in reconstructing the major determinants of students' choices of a medical career.

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Estudios sociológicos sobre la Educación Médica

Aunque es cierto que muchas Escuelas de Medicina de los Estados Unidos se dedican a mejorar la instrucción médica, sólo cuando tales esfuerzos implican cambios de importancia considerable, constituyendo lo que el Dr. Berry llamó "experimentos provocativos", despiertan el interés necesario para que se lleve a cabo un estudio metódico sobre su funcionamiento y efectos. Así, cuando la Facultad de Medicina de Cornell University introdujo su *Comprehensive Care and Teaching Program* (Programa de Enseñanza y Práctica Médicas Comprensivas) como "experimento en la Educación Médica", estableció, simultáneamente, una colaboración con los sociólogos a fin de evaluar los resultados de dicho Programa, así como de similares innovaciones introducidas por otras Universidades (las de Colorado, Pennsylvania y Western Reserve, sobre todo). En el presente estudio, llevado a cabo por los Profesores Merton, Bloom y Rogoff (del "Bureau of Applied Social Research" de Columbia University), se describen, en líneas generales, los conceptos y principios que rigen dichos estudios sociológicos, así como el carácter de los datos recogidos y algunos resultados ilustrativos.

Considerando a las Escuelas de Medicina como determinado ambiente social en que la enseñanza médica es asimilada de diferentes modos por los estudiantes mediante ciertos procesos sociales y psicológicos, el objetivo principal de la investigación es descubrir cómo y cuándo ocurre el tránsito del estudiante al profesional, al *médico* equipado con una serie de actitudes y opiniones profesionales fijas. Tales tránsitos, a veces bruscos, ocurren ya, en cierto grado, en el curso de los estudios, cuando el estudiante se ve forzado a adoptar sucesivamente papeles diferentes (en el laboratorio, la clínica, el hospital, y, a veces, en el domicilio de los pacientes). Esos cambios súbitos de actividad constituyen, en términos de Sociología, "zonas críticas de discontinuidad" y tienen un interés especial para la investigación. Otro objeto de estudio es la formación de las aspiraciones profesionales y generales que desarrolla el estudiante en el curso de su educación, lo cual suscita ciertas preguntas, por ejemplo: ¿En qué modo quedan afectados sus estudios si un estudiante decide demasiado pronto en su carrera académica dedicarse a determinada especialidad profesional?

Para estudiar el desarrollo de los estudiantes de Medicina según las líneas generales indicadas, los investigadores adoptaron un plan de investigación "longitudinal", según el cual los estudiantes son observados durante los cuatro años de estudios no graduados (dejando abierta la posibilidad de continuar la investigación luego a través de sus actividades como postgraduados). Los datos, hasta ahora accesibles (la investigación aun está en progreso), sobre las actitudes, experiencias, expectaciones y escala de valores estudiantiles fueron recogidos por los investigadores por medio de Cuestionarios: 1700 estudiantes, en varias fases de su educación, en las Universidades de Cornell, Colorado, Pennsylvania y Western Reserve, proporcionaron esos datos, que constituyen el principal material de investigación ahora en proceso de ser evaluado. También se ofrecen en el presente estudio algunos datos relativos a los factores que afectan la transformación de los estudiantes de Medicina en médicos, los cuales fueron agrupados en cuatro categorías principales: 1) El *status* social-económico de los estudiantes; 2) las relaciones sociales que éstos cultivan; 3) las ideas e imágenes de sí mismos que desarrollan los estudiantes; 4) sus actitudes hacia los pacientes, hacia la profesión médica en general y hacia las especializaciones.

* * *

Separatas de este artículo, en español, podrán obtenerse si son solicitadas por un mínimum de 25 lectores.

Editorials and Comments

Defining "Full-Time" for College Professors

IT IS A well known fact that a high proportion of college professors today supplement the limited salaries they receive from their institutions with outside income. This outside income derives from a wide variety of activities. A professor of economics may serve as a consultant to the Federal Reserve Board, a professor of chemistry may act as consultant to a chemical manufacturing concern, a professor of English may serve as an editor for a publishing house, a professor of history, or Greek or almost any subject, may write school or college textbooks and receive annual royalties. In the professional schools the professors of engineering may serve as consultants to bridge companies, construction companies, or manufacturing concerns, the professors of law may act as consultants to law firms or to business concerns, the professors in the medical school may act as editors for medical publishing houses or consultants to pharmaceutical manufacturers or they may serve as consultants to the local practitioners or take over the treatment of selected cases referred to them by local practitioners.

Complicating the picture in most medical schools is the fact that in addition to the school-centered professors, associate professors and assistant professors there are a much larger number of office-centered clinical professors, clinical associate professors and clinical assistant professors, who are engaged locally in the active practice of medicine and teach only from a few hours a year to several hours a week. Those clinical teachers who teach only a few hours a year are as a rule paid no salary, receive none of the professional perquisites of tenure and university contribution to annuity and are usually listed as "volunteer staff." Those who devote their chief time and energies to private practice but nevertheless carry a definite teaching responsibility week after week of the college year are commonly paid a nominal stipend (without tenure or university annuity contribution, however,) and are commonly listed as "part-time staff." The "geographic full-time" staff in most medical schools differs in the following respects from the "volunteer" and "part-time" staff: first, they are school-centered rather than office-centered and they are available to school needs continuously through the week; second, they are career teachers and researchers selected for their experience, training and ability and are usually brought to the school from a distance to fill a particular teaching need; third, they are as a rule academic minded persons who though trained as basic scientists or clinicians prefer the life and satisfactions of teaching and research with a sharply limited amount of practice, to the more remunerative but less reflective life of the busy practitioner of medicine.

To what extent is the situation of the "geographic full-time" professor of medicine or surgery different from the "full-time" professor of English, or history or engineering or law? One fundamental difference

is that the geographic full-time professor of medicine or surgery, to the extent that he sees private patients whether in consultation or for referred treatment, is engaging in the private practice of medicine and is thus in competition with certain local practitioners of medicine who might otherwise have that consultation or referred practice. It is thus obviously essential that the geographic full-time clinician observe meticulously the ethical code of the organized medical profession and that he at no time uses the name or prestige of the eleemosynary institution he represents to gain unfair advantage of the local practitioners. Essentially, however, the geographic full-time professor of medicine or surgery is as much a full-time employee of the university as is the professor of economics, or history, or the professor of agronomy or electrical engineering. He may see referred private patients two afternoons a week but he customarily devotes from four-fifths to five-sixths of his working time to teaching, research and administrative duties directly related to the school. And as a full-time teacher trained in and making a career of teaching, the geographic full time professor of medicine or surgery should be entitled to tenure, university contribution to retirement annuity and other perquisites of the career teacher.

Any attempt to define a full-time teacher as one who devotes his whole time to his university duties and receives his total income from the university is unrealistic, and shortsighted and would do irreparable damage to higher education if it were adopted. Universities bring together groups of scholars in a wide diversity of fields. As the results of their teaching and research they become expert in their particular field of knowledge. Their expert knowledge is naturally sought after by all types of manufacturers, publishers and users of expert services. As the result of the universities consenting to make the services of these teachers available to those needing the services on a consultation basis the universities avoid paying full salaries and yet obtain practically full-time services. If such cooperation between universities and the other consumers of specialized services did not exist competition would almost of necessity take its place to the detriment of all parties concerned. In the opinion of the writer any well qualified college professor who is devoting four-fifths to five-sixths of his work week to his university duties is entitled to classification as a full-time teacher even though he may be devoting one-fifth to one-sixth of his time to outside consultation work. D. F. S.

Professional Philosophy

The following is a letter written December 31, 1952 to Durwood J. Smith, professor of pharmacology, University of Vermont School of Medicine, from his father, Harry P. Smith, who was for 40 years a professor of education.

COOPERATE WITH the administration 100 per cent even though you disagree with it 100 per cent. If in disagreement, have a friendly chat to attempt to reconcile differences. This conversation should be with the administrative officer and not with colleagues or students or outsiders. If there is discussion with colleagues it should be in a staff meeting in which discussion is invited.

Respect your colleagues, giving them the benefit of every doubt until they demonstrate that they no longer merit one's respect. It is a great temptation for an authority in one field to recognize little or no merit in a colleague in another. One's own eminence is never enhanced by attempting to tear down another's.

Be loyal to one's colleagues as well as to the administration. Institutional harmony is based upon mutual loyalty and respect.

Never repeat gossip to a living soul. Await verification.

"Tickle" the egos of colleagues by doing and saying those things that tend to uplift them. Conversely, never do anything except in a great emergency that will tend to tear down the ego.

Make promises sparingly and then keep them regardless of cost.

Know one's subject and related fields. Leave no stone unturned to learn all that is old and new, and add to the sum total by new contributions.

Be critical of one's opinions and his own knowledge. Progress is made by those people who are critical of themselves and of existing knowledge. But with this critical attitude should come also a constructive attitude.

The instructor must never assume that he has "arrived." Such an attitude assumes a static position. But the rest of the procession moves on. If the great astronomer Seth Nicholson had taken that attitude when he discovered a new moon for Jupiter he might never have found three others—the last one this year, at the age of 61.

Know one's students *as persons*. Discover one or more personal items about each so that contacts may be on a personal as well as a professional basis.

Be friendly and sympathetic toward every student. Many carry burdens of which the instructor knows little or nothing.

Be careful of other's feelings. Wit and humor at their expense rarely yield a satisfactory reward.

Give the student the benefit of doubt at least until he proves himself a trickster. For example, a student claims to have submitted paper. It is possible that the instructor has misplaced paper. Such accidents have happened.

Never resort to sarcasm. If logic will not prevail, then the case is weak and sarcasm does not strengthen it.

Never "bawl out" a student—especially before his fellows. If he is a "smart aleck" outwit him so that group approval is with the instructor rather than with the student. (Group sympathy usually goes to the underdog.)

One must never assume that he is the greatest authority. Competence is determined by the *judgment of one's peers—not by his own.*

Have confidence in one's self. But do not permit that to become egotism, which is a "defense mechanism."

Do not be an intellectual snob. It is commendable for one to respect his own field of specialization, but after all it is only one of many that have contributed to modern science and to the advancement of our culture.

Be a good listener both with students and with colleagues. Preserve

an open mind on all debatable questions. Not only is this plain courtesy but it is one means of learning.

Reserve any reference to one's self and work until information is specifically requested.

Learn to know human nature. It is the most interesting study in the world.

Be friendly to all and interested in them and their problems—the trash carrier, the janitor, the patrolman, the laborer. Without each and every one we could not enjoy our present standard of living. Remember the "parable of the talents."

To make and hold friends, search until you find what is of interest to the other fellow and then exalt his ego by reference to that. What you are and do are of small moment to him in comparison with his work and problems.

Pay no attention to ill-natured remarks about one's self. Perform so that no one believes them.

Prepare for an entire course to be taught by doing two things:

1. Outline in some detail the objectives of a given course.

2. Prepare those activities through which the objectives can be realized.

Students should be given the objectives at the beginning of the course and reminded of them at frequent intervals through its progress.

Remember Rabelais' definition—"To teach is to cause to learn." The center of gravity of the group must be in the learner.

Never appear before a group—either student or peer—without careful preparation.

Invite discussion and tolerate (invite) disagreement, but insist that those in disagreement know why they disagree and are prepared to set up factual defenses for their position.

Praise good work done.

Do not waste time asking leading questions.

Always say less than you think.

Use a minimum of words to express one's ideas. Remember the Lord's Prayer, the Sermon on the Mount, the Declaration of Independence, and the Gettysburg Address for profound thoughts simply expressed.

NEWS DIGEST

Executive Council Meeting

The Executive Council Meeting of the AAMC was held in New York on June 19, 1956. The report of the meeting is as follows:

The Chairman of the Executive Council, Dr. Robert A. Moore, announced that Dr. Ward Darley, president of the University of Colorado, has accepted the Association's invitation to assume the newly created position of Executive Director of the Association. Dr. Darley will take up his duties with the Association on or before January 1, 1957.

In reporting on the work of the Committee on Financing Medical Education, Dr. Joseph Hinsey emphasized that the chief effort must be to amend Senate Bill 849 so as to add support of medical education to its present aid to medical research and increase the over-all sums to be made available proportionately.

It was reported to the Council that the American Medical Education Fund had voted to distribute its funds henceforth independently of the National Fund for Medical Education.

A statement issued by the Council on Medical Service of the American Medical Association and approved by the House of Delegates regarding the compensation of clinical teachers in medical schools was read and discussed. A resolution under consideration by the American Medical Association Board of Trustees relating to the information of Departments of General Practice in medical schools was read and discussed. The Secretary was instructed to inform the medical school deans of the Executive Council's attitude regarding both of these matters and to call their attention again to the statement "Meeting a Challenge to Medical Education" approved by the Executive Council at its February 1956 meeting.

Dr. George Packer Berry described plans for the 1956 Institute on the Evaluation of the Student (the appraisal of applicants to medical school) to be held November 7-10, at the Hotel Broadmoor, Colorado Springs, and the 1957 Institute on the Medical Student and His Problems to be held October 16-19, 1957 at the Chalfonte-Haddon Hall in Atlantic City.

The budget for 1956-57 as recommended by the President, Treasurer and Secretary was passed without change. It included $29,192.50 for the Executive Director's office, $67,630 for the Secretary's office, $69,465 for the Journal and publications (with an additional $13,000 outside grants for special projects), $107,062.50 for the Committee on Educational Research and Services (with an additional $47,500 outside grants for Institutes), $18,000 for the Medical Audio-Visual Institute (with an additional $18,000 outside grants for special projects), $16,500 special budget for moving, alterations, refurnishing and re-equipping in the new building.

Dr. George Aagaard's proposal of an annual collection of medical school staff salary data was disclosed. The home office staff was instructed (a) to collect from each school by questionnaire in the fall of 1956, data on maximum and minimum staff salaries at each of the various levels, (b) to

repeat this accumulation of data every third year, (c) to work up these data and make them available upon request from medical school deans (assuming that the anonymity of the individual school is maintained).

The Secretary reported progress in the building of the home office as follows: the basement is completed and the oil heater installed, the structural steel is all on the lot and most of it in place, the brick laying is well along. To date the construction is slightly ahead of the blue-printed time schedule. The hope was expressed that the dedication of the building may be scheduled on Saturday, February 9, preceding the 1957 Congress on Medical Education and Licensure.

Mail-ballot and interim decisions made by the Chairman of the Executive Council were approved as follows:

(a) Dr. Richard H. Young was named as the third representative to the National Board of Medical Examiners, replacing Dr. B. O. Raulston whose term has expired. The other two representatives are Dr. John Dietrick and Dr. Robert A. Moore.

(b) Two trustees of the "Evaluation Service for Foreign Medical Graduates" (shortly to be established) were named as follows: Trustee for 3-year term—Dr. John McK Mitchell; trustee for 2-year term—Dr. J. Murray Kinsman.

(c) The Association's acceptance of membership in the Joint Commission on Mental Illness and Health was approved and Dr. Howard W. Potter was named A.A.M.C. representative.

(d) The Association's participation in the Second National Conference on Exchange of Persons being planned by the Institute of International Education was approved and Dr. Richard H. Young was appointed the representative of the Association.

Continued participation in the work of the National Health Council was voted.

The school visitation program for 1956-57 was approved and the president was authorized to employ two part-time assistant secretaries to assist Dr. Smiley in carrying the A.A.M.C.'s part in this important program.

Dr. Moore named a Nominating Committee of seven and suggested that the chairman of that committee poll the deans of the 82 institutional members for nominations.

The Council expressed unanimous approval of Senate Bill 3430 which would create a National Medical Library starting with and taking over the collection now known as the Armed Forces Medical Library.

A tentative program for the 67th Annual Meeting of the Association to be held November 12-14, 1956, at Colorado Springs was discussed and left in the hands of the Program Committee for final action.

Discussion of the MEND program brought out the facts that there are now 25 schools included in the program and 34 more schools are on the waiting list, having expressed interest. Considerable progress has been made in making available to the schools many materials once unavailable. Though Dr. James Schofield will return to Baylor this Fall he will maintain direction of the MEND program until a suitable replacement is found.

Dr. Robert Moore was authorized to send a letter and questionnaire to all medical schools asking financial data for the National Fund for Medical Education. The questionnaire will be brought in line with the present questionnaire circulated annually by the Council on Medical Education and Hospitals for its Educational Number of the *J.A.M.A.* and distribution of the information received will hinge upon the approval of the Administrative Committee.

A summary of progress in medical schools under development:

1. Mississippi and Missouri will have their first fourth year classes in residence next year (1956-57).

2. Florida and Seton Hall will admit their first classes next year (1956-57).

3. Albert Einstein will admit its second class next year (1956-57).

4. The University of Kentucky has received an appropriation of $6 million to begin development of its medical school at Lexington.

5. A medical school is under contemplation by the University of Connecticut and the University of Michigan is considering a third school besides the one at Ann Arbor and Wayne in Detroit (Wayne became a state school July 1, 1956).

Benson Heads Aviation School

Brig. Gen. Otis O. Benson Jr. is returning to his former post as Commandant of the School of Aviation Medicine. General Benson replaces the late Brig. Gen. Edward J. Kendricks who took over this post when General Benson left for Air Force Headquarters in Washington three years ago.

Ford Foundation Reports Gifts

A total of $875 million in philanthropic grants from 1936 to 1955 has been made by the Ford Foundation according to their annual report. Most of this has been made in the field of education. For this the foundation allocated $437 million including a special appropriation for raising salaries of the faculties of private colleges and universities. For improving the services of voluntary, nonprofit hospitals, the foundation appropriated $200 million.

National Vitamin Foundation Makes New Grants

A total of $84,295.20 has been given to American universities throughout the country with 12 new grants of The National Vitamin Foundation, Inc. Effective July 1, 1956, they are designed to augment the extensive program of clinical and laboratory research already going on in the fields of vitamins and nutrition. Largest grant went to Dr. Robert W. Hillman, State University of New York, State University Medical Center in Brooklyn. Dr. Hillman received $33,463.20 for study of increased pyridoxine requirements in pregnancy.

Chairman of Mental Health Forum

The 1957 Chairman of the National Health Forum will be Dr. Francis J. Braceland, psychiatrist-in-chief of the Institute of Living in Hartford, Conn., and president of the American Psychiatric Association. The 1957 Forum, one of an annual series conducted by the National Health Council, will focus on fostering mental health in America with emphasis on action all health organizations can utilize.

Urology Award

The American Urological Association offers an annual award of $1,000 (first prize $500, second prize $300 and third prize $200) for essays on the result of some clinical or laboratory research in urology. Competition is limited to urologists who have been graduated not more than 10 years, and to hospital interns and residents doing research work in urology. Those wishing full particulars can write to the executive secretary, William P. Didusch, 1120 North Charles St., Baltimore, Md. Essays must be in before December 1, 1956.

Senior Postdoctoral Award Program

The National Science Foundation announces that the final date for applications for a second group of senior postdoctoral fellowships to be awarded in the current calendar year is September 4, 1956. Fellowships will be awarded in medical, physical, mathematical, biological, engineering and other sciences. Candidates must have at least five years experience beyond the science doctorate or its equivalent and have demonstrated ability and special aptitude for advanced training. Applications and further details can be obtained from the Division of Scientific Personnel and Education, National Science Foundation, Washington 25, D. C.

New Albert Lasker Awards

The International Society for the Welfare of Cripples and the Lasker Foundation have made a joint an-

nouncement of three triennial Albert Lasker Awards for "Outstanding services in the development of services for the physically handicapped." The first awards will be presented at the Seventh World Congress of the International Society in London on July 24, 1937. The awards consist of a silver statuette of the Winged Victory of Samothrace and $1,000. Their purpose is to emphasize the importance of improving services for the physically handicapped.

V.A. Allots $10,000,000

The Veterans Administration has had $10 million appropriated by Congress to carry on a year's program of medical research designed to help solve the riddles in major areas of disease. Most of the money will go into studies of brain diseases, diseases of the heart and arteries, cancer and leukemia and problems of aging. It is part of a continuing study of all man's diseases in which the Veterans Administration works in close affiliation with 74 medical schools that supervise their research projects and train their scientists.

Scholarship Program Expanded

In announcing the winners of the Alfred P. Sloan National Scholarships, the Sloan Foundation has also announced an expansion of its scholarship program to embrace 13 colleges and universities and to make awards to some 240 students. Future grants will total more than $420,000. Individual awards range from $200 to $2,000 per year, determined by the colleges participating in the project and the individual student's financial need.

New Armed Forces Medical Plan

The Selective Service System and the Department of Defense have developed a program to permit physicians who are liable for military service to be commissioned well in advance of the time they will be required to serve, and to permit successful applicants to be deferred for residency training in specialties required by the Armed Forces.

Purpose of the program is to provide the Armed Forces with the physicians they need and to permit draft-liable physicians a choice of service, and draft-liable interns a chance to apply for and receive reserve commissions and be ready to enter duty immediately following completion of internship.

Participants must be 1956 graduates of an approved American or Canadian medical school liable for two years of military service and willing to accept a reserve commission in either the Army, Navy or Air Force. Correspondence concerning commission and time of call to active duty should be addressed to the military department to which the applicant has been allocated.

College Briefs

Albert Einstein

Dr. EDWARD JAMES HEHRE, formerly associate professor at Cornell, has been named professor and chairman of the department of microbiology and immunology.

Chicago Medical

Dr. JOHN LESTER NICKERSON has been appointed chairman and professor of the department of physiology and pharmacology. Dr. Nickerson for the past six years has been professor of physiology at the College of Physicians and Surgeons, Columbia University.

U. of Chicago

New appointments to the medical staff are: Dr. R. HUGH DICKENSON to associate professor of psychiatry; Dr. J. FREDERICK BELL to director of viral and rickettsial fever research for the United States Navy in Cairo, Egypt

CONSTRUCTION HAS BEGUN on the first of two units of the Basic Science Building in the Medical Center at the University of Michigan. This $8 million project will house the departments of biological chemistry, pathology and pharmacology, along with the administrative offices of the school and the school of nursing. Architects conception of the building is shown here.

(a project directed by the school for the Navy); Dr. EDITH POTTER to professor of pathology in the department of obstetrics and gynecology; LESTER B. SKAGGS to director of the Health Physics Service; KENNETH P. DU BOIS to director of the United States Air Force Radiation Laboratory on the campus; HERBERT D. LANDAHL to professor of mathematical biology.

Cincinnati

Grants totalling $33,780 have been received from the National Institutes of Health for work on skin diseases by the department of dermatology. Dr. LEON GOLDMAN, head of the department, will direct the projects. Dr. ALBERT B. SABIN, at the invitation of the Russian minister of health, visited Russia early this summer to study the country's facilities and research activities on poliomyelitis. On July 26th, at the International Congress of Pediatrics in Copenhagen, Dr. Sabin spoke on "The Present Status of Work on Immunization of Human Beings with Live Attentuated Poliomyelitis viruses."

Columbia

Dr. DAVID RITTENBERG has been named executive officer of the department of biochemistry. Dr. Rittenberg replaces Dr. HANS T. CLARKE who retired this June.

Duke

The psychiatry department has been awarded a $211,000 research grant by the National Institute of Mental Health. The grant will provide for a five-year continuation of research on the effect of aging upon the physiological and psychological functioning of elderly people. Dr. EWALD W. BUSSE, department chairman, is chief investigator for the project.

Florida

Foundation work for the $9 million, 400 bed hospital has begun and is expected to be completed in September 1958. The first medical class will begin this September in the nearly completed $5 million Medical Sciences Building.

Georgetown

A grant of $22,949 has been received from the National Foundation for Infantile Paralysis to study drugs which could prevent or dissolve kidney stones. The project will be directed by Dr. MARTIN RUBIN, executive head of the chemistry department and is effective for an 18-month period.

Hahnemann

Four honorary degrees were awarded at the 109th annual com-

mencement exercises. Dr. KARL AGRE received the first degree of doctor of Philosophy from the graduate school of basic medical sciences. Frank M. Porter, president of the American Petroleum Institute delivered the commencement address and was awarded the honorary degree of doctor of laws. Francis Boyer, president of Smith, Kline and French Laboratories, received an honorary doctorate of laws. Dr. DONALD GUTHRIE, surgeon in chief of the Guthrie Clinic in Sayre, Pa., received the honorary degree of doctor of humane letters.

Harvard

Dr. JOHN ROCK, authority on the physiology of human reproduction, has retired to become clinical professor of gynecology, emeritus.

Louisiana

The China Medical Board has made an additional grant of $40,000 for a third year of the fellowship program for teachers conducted here for teachers from all U. S. medical schools who wish practical experience in tropical medicine in the American tropics. Now in its second year of operation the program is conducted by Dr. HENRY E. MELENEY, research professor of medicine and Dr. WILLIAM W. FRYE, dean and professor of tropical medicine. Thirty-three teachers have had the experience of two months in the tropics. These selected fellows spend two days in an orientation program and then proceed to Central American or the Caribbean islands for a period of eight weeks.

Med. Coll. of Va.

Dr. R. BLACKWELL SMITH Jr. has succeeded Dr. WILLIAM T. SANGER as president and Dr. Sanger has become chancellor. Dr. DAVID M. HUME has been appointed professor of surgery and head of the department of surgery. Dr. Hume has been assistant professor of surgery and director of surgical research at the Harvard medical school. Dr. WARREN E. WEAVER has been appointed dean of the school of pharmacy.

Medical Evangelists

Dr. ROGER BARNES, chairman of the department of urology, left in July for Christian Medical College, Vellore, India, where he will lecture in urology and set up the first urology training program to be given in India. Dr. Barnes received a Fulbright award for this purpose. He will return next summer.

Dr. CYRIL B. COURVILLE, professor of neurology, was elected honorary vice president of the National Medical Librarians Association at their annual convention this June.

Michigan

Dr. HORACE DAVENPORT is the new chairman of the department of physiology. He replaces the late Dr. ROBERT GESELL.

A department of human genetics has been established as an independent department, led by Dr. JAMES V. NEEL.

Dr. RUEBEN L. KAHN, discoverer of the Kahn Test for the detection of syphilis, professor of serology and director of the serologic laboratories, has retired after 27 years of service. Dr. Kahn plans to concentrate on research work.

Nebraska

As a part of the development of the faculty five new department chairman have been named. They are: Dr. GORDON E. GIBBS to chairman of the department of pediatrics; Dr. ROBERT L. GRISSOM to chairman of the department of internal medicine; Dr. MERLE M. MUSSELMAN to chairman of the department of surgery; Dr. ROY G. HOLLY to chairman of the department of obstetrics and gynecology; and Dr. FRANK KLABENES to associate professor of otorhinolaryngology.

Northwestern

A $75,000 grant from the John and Mary Markle Foundation has been given for the study of a program to combine pre-medical and medical education. A portion of a recent $300,-

000 grant from the Commonwealth Fund also will be used to support the study. The new teaching plan would be designed to provide one continuous program of education in basic sciences, humanities and medicine. Students would begin the new course upon graduation from high school and finish with the degree of doctor of medicine. The Markle Foundation grant is for three years and will be conducted jointly by medical, liberal arts and graduate faculty members.

Oregon

A trust fund consisting of securities valued at approximately $200,000 has been established for research. To be known as "The Dr. Laurence Selling Fund" in honor of Dr. Selling, professor emeritus of medicine, it has been established by a friend of the school who wishes to remain anonymous. Research projects developed with it are to be named by the dean.

Pennsylvania

Dr. COLIN M. MACLEOD has been appointed the John Herr Musser professor of research medicine and chairman of the department of research medicine. Dr. MacLeod succeeds Dr. WILLIAM C. STADIE who has retired as professor emeritus.

New York Medical

Dr. MARTIN L. STONE has been appointed professor of obstetrics and gynecology and director of the department.

SUNY—Brooklyn

Dr. JOSE DEL CASTILLO of London, England, has been appointed visiting professor of physiology for one year beginning September 1. At present Dr. del Castillo is a professor in the department of biophysics at University College, London. He received his medical training at the University of Madrid.

SUNY—Syracuse

Dr. C. BARBER MUELLER has been appointed the first full-time professor and chairman of the department of surgery.

A grant of $274,050 has been received by Dr. JULIUS RICHMOND, professor and chairman of pediatrics, from the Ford Foundation. It will be used to study the factors which lead some babies to grow into happy, normal adults while others grow up with mental and emotional difficulties.

Temple

Upon the special request of President Robert L. Johnson and the executive committee of trustees, Dr. WILLIAM N. PARKINSON has agreed to forgo retirement plans and continue for an additional three year period to be dean and vice-president of the medical center. This request was prompted because of the extensive $12 million expansion program which is soon to be completed. The building now in progress will increase the university hospital capacity to 1,000 beds. Facilities will include in-patient and out-patient buildings and an ancillary unit housing operating rooms and a complete x-ray department.

Tulane

Dr. CLIFFORD G. GRULEE Jr. has been promoted to professor of pediatrics. Dr. ARTHUR O. KASTLER has been promoted to professor of biochemistry.

Yale

Polio protection by inoculations of the Salk vaccine followed by injection of live virus vaccine is being studied by Dr. JOHN R. PAUL and his associates under a grant of $137,524 from the National Foundation for Infantile Paralysis. The grant covers the second year of a five year project.

U. of Washington

Dr. EDWARD ALLEN BOYDEN, visiting professor of anatomy, received a citation in June from the Minnesota State Medical Association in recognition of the contribution he has made to surgery of the lungs. Dr. Boyden is president of the American Association of Anatomists. His major work "Segmental Anatomy of the Lungs" was published last year.

Book Reviews

Undergraduate Education on Trauma

From a news article published in the Bulletin of the American College of Surgeons, May-June, 1956.

Dr. Harrison L. McLaughlin, chairman of the subcommittee on education of the American College of Surgeon's Committee on Trauma issued a recommendation that the committee "recognize the achievements and potentialities of the MEND program in elevating the standards of undergraduate teaching in trauma, and provide this program with support in every way possible." This was agreed upon by the committee.

Referring to undergraduate education Dr. McLaughlin stated that the time allotted to trauma in general and orthopedic surgery in the average curriculum is ample. However, he said, there has been inadequate correlation between the basic sciences and the clinical applications, between general surgery and surgical specialties; and little clinical continuity of experience or observation in long term care of the injured.

The MEND program, he said, has made progress toward integrating information about trauma and its plan has been well received. Data has been gathered to show that the quality, integration and interest in the teaching of trauma has reached highest levels in schools carrying the MEND program and has increased in proportion to the duration of the plan. This means a great deal to young physicians who formerly were inadequately prepared for military medicine. L.S.

A Course in Practical Therapeutics, 3rd Edition

M. E. Rubfus and **A. H. Price.** The Williams and Wilkins Co., Baltimore, 1956 972 pp.

No field in modern medicine is developing more rapidly or more complexly than is therapeutics, and consequently, both students and established practitioners are constantly in need of simplifying and interpretative compilations in order to keep abreast of current advances. The stated purpose of this volume is "to bring to the student and the practitioner in the simplest form, modern treatment of disease," a laudable, but difficult undertaking. The mass of material in this large volume is divided into four major sections entitled "General Therapeutic Principles," "Symptomatic Therapy," "Treatment of Specific Disorders" and "Special Treatment."

The third of these is by far the largest and within it the subsections on specific diseases usually contain items on etiology and diagnosis as well as on therapy. This is a useful combination, but one has the impression that in attempting to do too much, the book fails to do anything thoroughly. In most of the book, a telegraphic style predominates, and precludes adequate discussion and explanation. In the reviewer's opinion, it is particularly important in a rapidly changing field such as therapeutics to impart fundamental information regarding the "whys" and "hows" of the action of various agents and procedures in order to prepare the reader to withstand the deluge of new agents which will otherwise rapidly outdate a book of this type. The organization employed required that most agents be presented in many different sections, and this in itself makes thorough discussion difficult, particularly in the absence of extensive cross-referencing. The fourth section on "Special Treatment" only partially compensates for this deficiency.

The therapeutic outlines themselves are in general quite up to date and commendably combine consideration of

physical and psychological factors with specific surgical and drug therapy, a correlation which is often neglected. However, in common with most of the rest of the book, they suffer from lack of adequate discussion, and the toxic reactions and dangers of various therapeutic procedures are often inadequately covered. In many places the reader is faced with an imposing list of possible agents and procedures with little indication of relative effectiveness, special indications or the role of combinations. In common with most multi-authored texts, different sections vary widely, and many exceptions to the above commendations and criticisms can be found.

It is somewhat difficult to visualize the appropriate role of this volume in the broad field of medical education. Textbooks providing more adequate discussions of mechanisms of drug actions would appear to be a sounder source of information for the student obtaining his first knowledge of therapeutic agents, and a more satisfying source for the practitioner desiring to develop a more rational use of therapeutic agents. At another extreme, the individual seeking complete information on how to treat a specific patient would be better served by books giving the detailed plan of management of some specialist. Perhaps the present volume would best serve as an outline for a lecture or conference course in therapeutics, or to jog the memory of the practitioner who already has a good background in therapeutics. In either role it leaves a considerable burden on the associated teaching or prior information.

Mark Nickerson, *Manitoba*

The Complete Medical Guide

Benjamin F. Miller, New York, **Simon & Schuster,** 1956. XII plus 913 pp. Illustrated, $4.95.

This is a book written for adults and designed to provide them with information on health and medical matters. It covers a wide range of topics, and is intentionally comprehensive in approach. In preparing this volume, the author, Dr. Benjamin F. Miller, intended it to serve as a guide in health matters, to serve as a reference work, and to help the patient play an intelligent part in the doctor-patient relationship.

Dr. Miller has achieved his aims in a satisfactory manner. Almost no aspect of health remains uncovered in a practical, down-to-earth way—from care of the teeth to psychiatry, from diet to wonder drugs. There are chapters devoted to marital problems, pregnancy, child care, home nursing, job hazards, nutrition, mental health and many others. Every major disease, such as cancer and diabetes is considered, as well as many less common conditions. In addition, the book provides a dictionary of medical terms most likely to be encountered in daily life.

Stress is placed on the preventive approach to health problems, on early detection, and on the dangers of self-medication and diagnosis. This is a book that can be recommended to patients and their families. Included are a number of line drawings prepared under the author's direction.

George Rosen, *Columbia*

Laughter And The Sense Of Humor

Edmund Bergler, M.D. Intercontinental Book Corporation in Cooperation with Grune and Stratton, Inc., New York City. 1956—297 Pages with Index.

One of Dr. Bergler's concluding paragraphs reads "the theory of laughter presented in this book is admittedly not popular, nor is it likely to become popular. The whole concept of the superego, psychic masochism, double inner defenses, belongs in the higher psychic mathematics. The inner facts should be blamed, not the translater." With the first statements, this reviewer is in accord; with the last statement, there might be considerable doubt. The author has written extensively on diverse psychological subjects, fitting them all neatly into his Procrustean theory of the defense against psychic masochism. This present subject is the next to be similarly treated.

The book offers many references in the theories of wit, humor and laughter from Plato onwards, which would be of help to the research scholar, but little insight has been added to our knowledge that was not set forth in Freud's study of "The Wit And Its Relation To The Unconscious," published in 1905.

A more definitive study is yet awaited on this necessary phenomonon showing its anxiety diminishing function and its role in specific cultural groups.

LeRoy P. Levitt, Chicago Medical

Obstetric Practice

Speert and **Guttmacher,** McGraw-Hill Landsberger Medical Books, New York, 1956, 478 pp with Index.

This handbook for the general practitioner presents a surprising amount of extremely reliable, up-to-date, factual

information. Not only does this 450-page book present practical details in a most readable manner but also in a readily available form.

Although references, controversial and theoretical points, as well as elaborations on anatomy and physiology of pregnancy are avoided, they are scarcely missed in such a book. The mention of pharmaceutical products by trade-name would seem to be a rather arbitrary and controversial departure, but by and large, only the better-known, accepted preparations are included—probably a worthwhile addition for the busy practitioner.

The material included embraces not only hygiene of pregnancy and minor complaints of gestation, but also up-to-the-minute information on present-day concepts of the treatment of such complicated entities as the toxemias, hypofibrinogenemia and the metabolic disorders of pregnancy. Most obstetrical specialists will readily concur with the sage advice given with regard to the management of abortion, the pregnant cardiac patient and with indications for therapeutic interruption of pregnancy. Numerous simple tables or listings are available and the frequent inclusion of percentage likelihood, together with important and interesting comparisons are noteworthy.

The authors categorize the obstetric pelvis according to x-ray terminology, and actually bury the commonly accepted indices of pelvic adequacy amongst roentgenological concepts which are difficult for many practitioners to follow—especially when radiologic techniques are not readily available. It would also seem unnecessary in a book of this type to describe curettage in the completion of abortion, and destructive operations such as decapitation of the dead fetus.

The chapters on normal labor and delivery, the management of labor problems and the complications of late pregnancy are very well done. It is refreshing to find a listing of the contraindications to cesarean section as well as indications. This is an example of the fine critique exemplified in this book.

The authors include a final chapter on the newborn. Nevertheless, the book is long enough and is complete without it, and the chapter could well have been included together with diseases of the neonatal period in the proposed companion volume on pediatrics.

Not only can this well-written and finely printed book be recommended for the general practitioner, but also perhaps for the physician planning a refresher or postgraduate course in obstetrics.

Ralph C. Benson, *U. of California at San Francisco*

Integrated Gynecology

I. C. Rubin, M.D. and **Josef Novak, M.D.** The Blakiston Division, McGraw-Hill Book Company, Inc., New York, 1956, 3 vols.

This excellent work represents the accumulated thoughts and experiences of two world famous gynecologists. Their professional friendship of fifty years has brought to print a timely, comprehensive three volume text which correlates gynecology with all areas of medicine. Gynecology is defined as the "science of woman in health and disease."

Anatomy, embryology and pathology are well documented from the Viennese school of thought. The chapter on evolution and involution is an especially clear and useful presentation about the development of the urinary and genital organs. The early introductory chapters are livened by appropriate photographs demonstrating clinical pathologic problems.

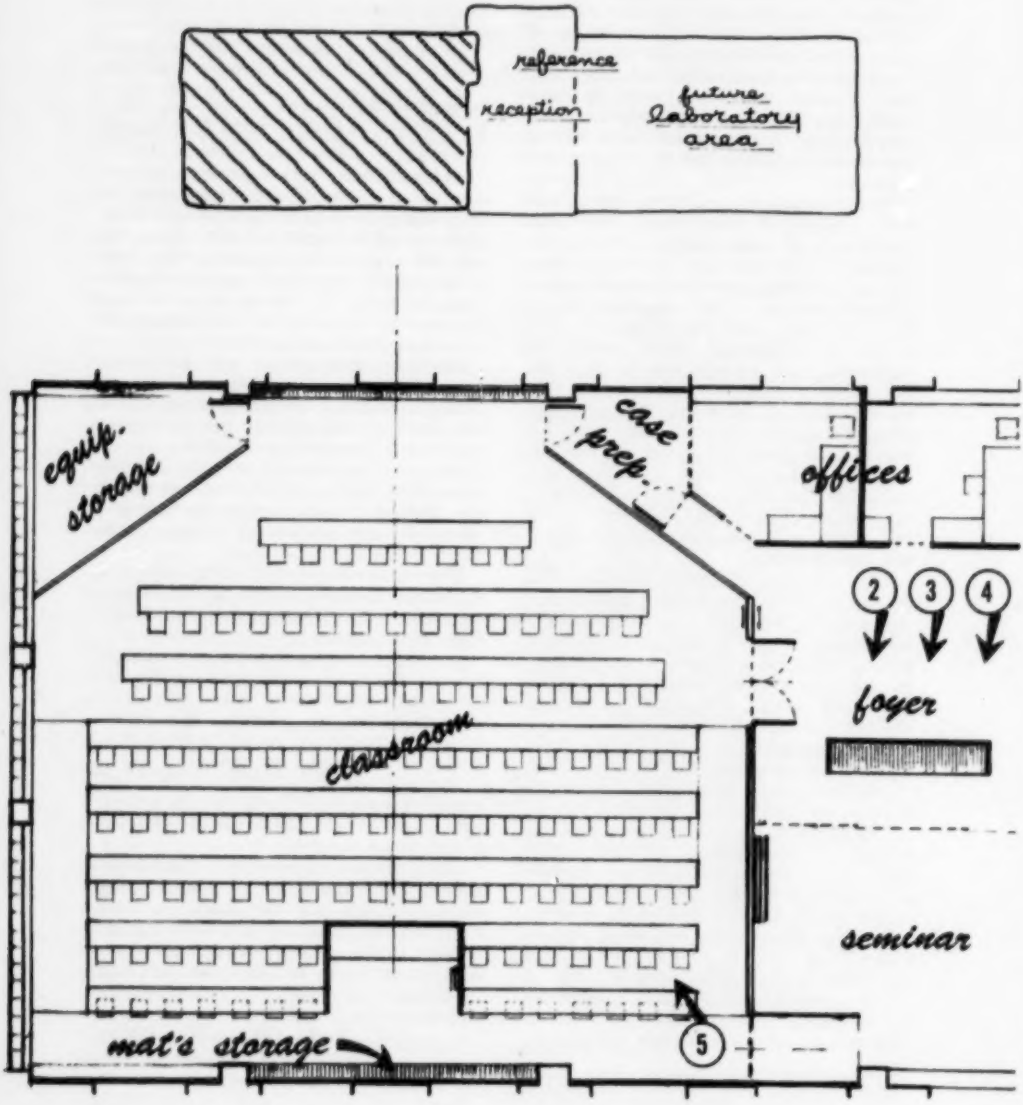
The illustrations are abundant and excellent. They vary from line drawings, to clear photomicrographs, to actual color photographs.

The third volume is directed primarily toward the relationship between the reproductive organs and other body systems including the psyche. This information is far more complete than that of the usual gynecologic text.

The authors have provided an overabundance of references. Out of a total 1766 pages of text, 231 pages are devoted to reference material.

These three volumes are a clear presentation of gynecology as a developing science of the last half century. They focus on the need for correlating gynecology to the patient's total needs. Student, practitioner, and specialist will find Integrated Gynecology useful as a text and reliable as a reference.

John Parks, *George Washington*



schematic plan layout

preliminary design sketches

"PROTOTYPE ALL-PURPOSE TEACHING SUITE"

the ASSOCIATION of AMERICAN MEDICAL COLLEGES

University of Kansas Medical Center
Kansas City, Kansas

[undergraduate & post-graduate]

AAMC CONSULTANTS : DASELL BOYD HARMON & ASSOCIATES

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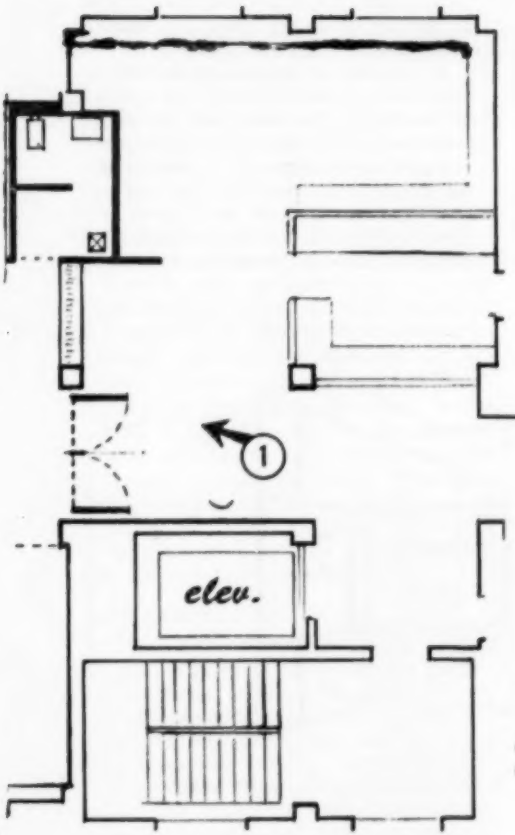


Objectives

To minimize physiological stress
To minimize physical and mechanical problems
To maximize adaptability

The sketches on the following pages are views from the five stations indicated by the encircled numbers.

Plans for a Prototype Medical Teaching Area

The Objectives

A medical education is a challenging and critical experience. Because of the volume of information and skills to be learned and mastered with a high degree of accuracy it is a high stress-producing procedure. The inevitable effect of the restraints or freedoms of the physical environment in distorting or promoting communication must be considered, and prompts the formulation of the first object:

1. *To bring into design those arrangements or controls which will minimize stress-producing factors and distortions of the student's perception of the materials to be mastered or the skills to be acquired.*

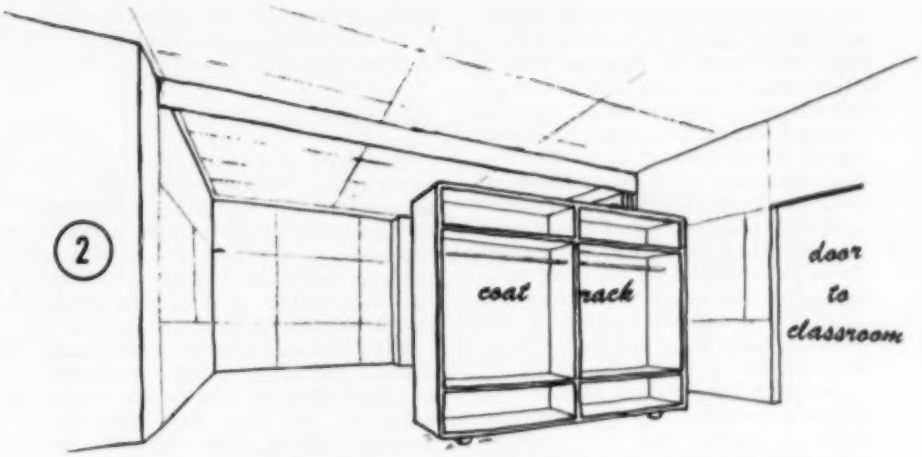
Medical education with a long experience of drawing on laboratory sciences has ever been alert to the use of visual materials such as demonstrations, case presentations and slides. The materials and devices used in medical teaching are being augmented rapidly, thus:

2. *An all-purpose teaching area should be arranged so it can make the most of any method, material or device.*

Devices call for power sources and controls over an interfering environment. Many of these devices are in a state of rapid change and development, i.e., TV, so the design must be in terms of basic principles which guard against the freezing of any type of device. Thus the need for adaptability is further enhanced.

A complex of devices and controls can become inconvenient and stress-producing to the detriment of learning or communication. Gadgets must require a minimum of conflicting attention on the part of the teacher and students and be so easy to use that teaching is not jeopardized. The objective may be stated as follows:

1. Entrance off elevator as seen from Station 1, shown on sketch on title page.



2. Foyer and seminar room looking past movable coat rack with movable partition between foyer and seminar room folded back as seen from Station 2, on title page.

3. *An all-purpose teaching area should be arranged so that it presents a minimum of physical problems.*

Fool-proof automation can be employed when it does not prejudice economy. For example, a photo-electric cell directed at the projection surface can automatically activate the dimmer switch for quick changes demanded by differences in slide brilliance thereby maintaining at all time a maximum room light consistent with projection. However, economy demands that most devices and environmental controls be activated by human hands. Therefore the needs for additional black board space or X-ray viewers must be satisfied by manual manipulations made as convenient as possible.

Prologue to a Plan

The methods, materials and equipment of medical education are undergoing significant changes. These changes force attention on the inadequacies of the physical learning environment which inevitably influences the effectiveness of the methods and materials used. Great sums of money will be spent on medical school plants during the next few years. These buildings will restrict or facilitate medical education to the extent that they are planned for use in the future rather than the immediate past.

The Medical Audio-Visual Institute has been increasingly conscious of the lack of concrete information available for medical classroom designers. A great deal of study in other areas of education, particularly public school education, has resulted in significant changes in school architecture and classroom design. It seems important, therefore, that what is known should be adapted and evaluated for its potential value to medical education. It is equally important that medical education seriously study the learning environment from the unique standpoint of the medical student. Further, medical education should be in a position to guide the architects and planners of our public schools.

Members of the Committee on Audiovisual Education of the Association have urged the Institute to consider school planning problems. Tom Jones, professor emeritus of the University of Illinois College of Medicine, has been especially active and helpful. As a result there has been much study and many discussions with var-

ious people interested in architecture and design. Among those solicited for help was Darell B. Harmon, one of the foremost building consultants on the learning environment, and his help has resulted in concrete action. *Darell B. Harmon of D. B. Harmon and Associates of Austin, Texas, is responsible for the plans presented here. The plans described here recognize the extensive studies carried out by Dr. Harmon on the environmental hazards of learning, and on classroom design, materials and equipment. The sketches were prepared by Dr. C. A. Winkelhake of his staff.*

Industry has shown considerable interest in seeing that the plans become a reality and have offered materials and equipment to the extent that they can meet specifications.

The University of Kansas School of Medicine has invited the installation of a test area within their existing plant. The offer includes space as well as the costs of deconstruction and installation of the test materials and equipment.

Further invaluable cooperation has come from *School Planning*, a magazine devoted to scientific school design, in encouraging industry to adapt and apply their product developments to the specific needs of medical education. In the August issue are sketches and details for the architectural firms and building industries that read its pages.

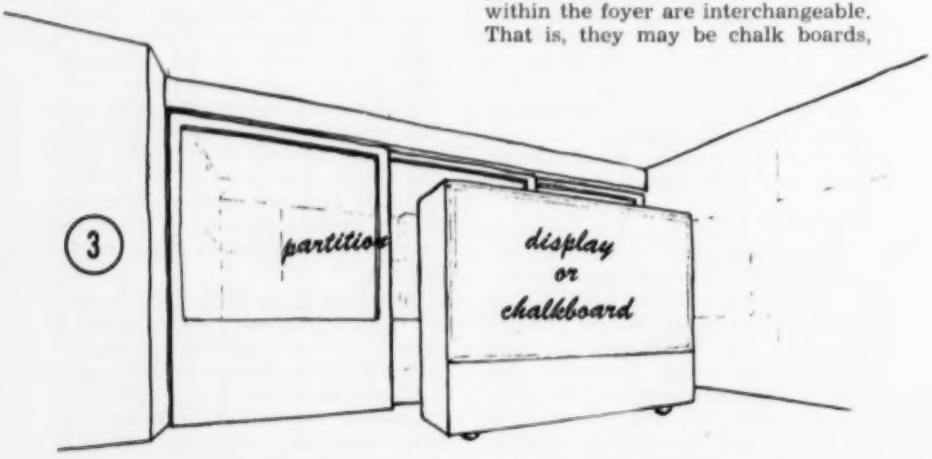
The Overall Layout

The floor plans call for a large classroom, a seminar room, two offices and a foyer. No laboratory facilities, properly part of a teaching suite, have been planned. (Laboratory space, if included, is represented by the non-shaded area of the small sketch on title page of this article.)

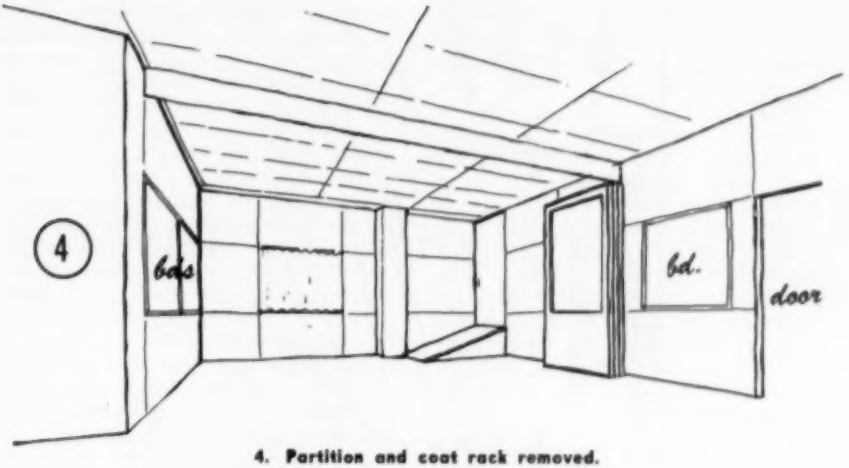
The economies of medical education demand that cores of the curriculum be presented to the whole class simultaneously and thus determine the necessity for a large classroom or lecture room. Medical education also requires small group and individual instruction demanding a seminar room. Offices related to this type of organization ought to be close for easy access and to encourage informality.

Combined Foyer and Exhibit Area

Plenty of exhibit area is provided for in the foyer. The glass case forming the entrance wall is designed and illuminated to hold transparencies, models or 3-dimensional transparencies. Surfaces of exhibit areas within the foyer are interchangeable. That is, they may be chalk boards,



3. Movable partition dividing room, and coat rack turned as seen from station 3.



4. Partition and coat rack removed.

cork boards, or peg boards as the need demands. It is evident that all existing display devices have shortcomings and therefore the vertical surface devices are not made part of the structure.

A coat rack on wheels is put into 12-month service as a traffic or space divider. The upper back of the rack has a modular mounting for alternative exhibit or chalk board surfaces. The lower back surface may be swung horizontal at table height for table top use including displays.

The Seminar Room

The seminar room will handle a maximum of 20-30 for small group teaching. If occasion demands the folding wall between it and the foyer may be thrown open for the accommodation of a somewhat larger group. This area may likewise serve as an overflow area for the occasional audience too large for the lecture hall. If the form of communication is verbal the sound system of the lecture hall can be tied into the foyer. If visuals are important a closed circuit television receiver or screen may be used.

A projector station at the rear corner of the room is convenient to the equipment and power supply area of the lecture room.

The Offices

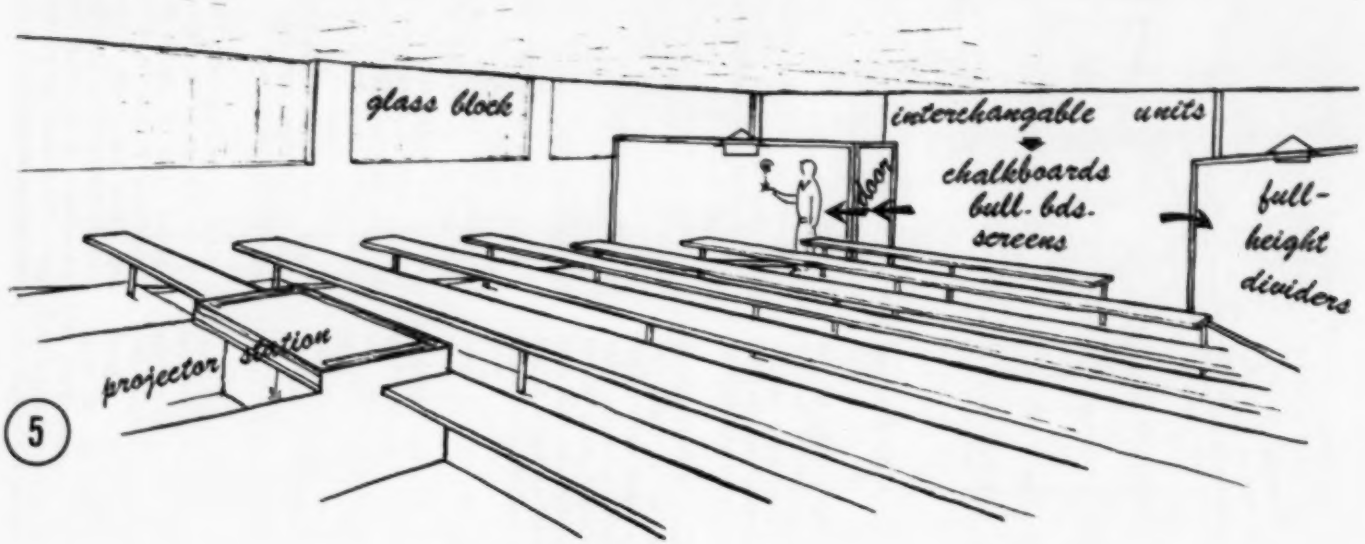
The offices provide teachers with work-communication centers. The type of office is borrowed from business, and allows for ready space reorganization without waste. The partitions, desks and cabinets are assembled from integrated units and can be fully rearranged.

The Lecture Hall

Presentation Area. The front of the room is broken into three surfaces by space dividers or angled walls. The angled or rotated walls help correct the visual distortions necessary in using a large area. The three surfaces are equipped with interchangeable panels for a wide variety of teaching uses.

The space behind the angled walls provides storage and space for materials preparation and live preparation.

Seating. Seating for a maximum of 120 is provided. The desks are continuous lines of cantilevered tables permitting a greater flexibility of use. The seats are fastened-down swivel chairs. They provide for easy orientation to a visual task at any part of the room and provide for easy and silent access.



5. Classroom. Swivel chairs and other details not shown.

The risers begin behind the third row of seats thus providing a natural division for small groups utilizing the front of the room and in good relationship to all the facilities of the lecture hall.

Lighting. A large area light source achieved from a modified luminous ceiling provides a correct light level without harmful contrasts. Provision is also made for greater illumination on the teaching situation consistent with both needs for attention and light contrast limits.

Light level and drape closure are operated from the same control. Dimmers that handle a room of fluorescent lights are expensive. Therefore the first stages of dimming are effected by switching out some lamps of each of the ceiling units in a pattern that will lower intensity without altering contrast. The remaining lights are reduced by an economical dimmer. Thus, rotation of the light control arm will: first, turn out some lights in progression; second, close the drapes; and finally, dim the remaining lights to total darkness if necessary.

Colors. The total of reflected light is kept as close to the middle of the color spectrum as possible to avoid visual distortions and stress. Individual colors are more apparent than real.

Thermal. An area or unit ventilator controls humidity, heat dissipation and air movement. Three or more thermostats read and equate area conditions and activate the heating or cooling unit.

To Test and Modify

The proposed teaching area described in outline is intended for demonstration. In addition it will be tested and modified as use experience dictates. It will not be protected as a show piece. It will be subjected to as high use traffic as possible. Although the specifications are supported by a great deal of study and research* the special and ever changing needs of medical education demand full evaluation of its application. It is expected that the teaching area will be evaluated not only in terms of physical convenience but also in terms of physiological stresses that hinder learning. J.E.F.

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The Personnel Exchange

Faculty Vacancies

• M.D. or PH.D: Well-experienced in diagnostic microbiology and in teaching medical students who desire to work in the microbiology department of a medical school and in the laboratory of a large hospital. Vacancy to be filled before the beginning of the next academic year. The starting salary depends on background and experience, but for a qualified person would range about $7000 per year. Teaching obligations are moderate, time for research work with satisfactory opportunities and equipment. Address: V-46.

• PSYCHIATRIST: Opening for full-time employment in VA hospital. Acute intensive treatment service affiliated with Baylor University College of Medicine and Texas Medical Center. Teaching of residents as well as care of patients is required. University appointment commensurate with qualifications. Superior opportunities to do laboratory as well as clinical research. If certified, depending on qualifications, pay may be as high as $13,760. Also, excellent opportunities for experience years after residency to prepare for certification. Write Manager, VA Hospital, Houston, Texas.

• PSYCHIATRIST: Full time for school of medicine, active teaching and treatment program. Salary open. Address: V-47.

• ASSISTANT PROFESSOR OF PHARMACALOGY: Ph.D. or M.D., latter preferred. Teaching, administration and research. Salary $4,500-$6,000 depending upon qualifications and experience. Address: Dr. M. F. Murnaghan, Department of Pharmacology, University of Ottawa, Ottawa, Ontario.

• PREVENTIVE MEDICINE: Administrative-teaching position teaching public health to medical students; coordinating preventive medical services and medical supervision of an outpatient service. Address: Dean F. G. Gillick, Creighton University School of Medicine, Omaha 2, Nebraska.

• PH.D.'S: In the general field of microbiology, immunology, virulogy, bacteriology and pathology. To assist in virus research for manufacturer of veterinary biologics, vaccines and serums. Principal activity toward new product development, experimental and clinical studies of products, product improvement and techniques and standards of production. Address: V-48.

• BACTERIOLOGIST: Assistant professor and assistant bacteriologist, Provincial Laboratory (combined appointments). M.D. with some experience of hospital or public health bacteriology. Initial salary $6,250 plus cost of living bonus, approximately $300. Promotion to associate professor on satisfactory service. Apply to the dean, faculty of medicine, University of Alberta, Edmonton, Alberta, Canada.

• ANESTHETIST: For two or three year appointment at the American University Hospital in Beirut, Lebanon, beginning in summer or fall of 1956. Academic rank of assistant, associate or full professor depending upon experience. Apply by air mail to: Dr. Joseph J. McDonald, Dean, American University of Beirut, School of Medicine, Beirut, Lebanon.

• POSITIONS IN INTERNAL MEDICINE AND MEDICAL ONCOLOGY: At research institute affiliated with medical school. Excellent opportunity for both clinical and basic research. Generous intramural budgetary support. Tenure. Address replies to Division of Internal Medicine, Roswell Park Memorial Institute, Buffalo 3, New York.

• INSTRUCTOR OR ASSISTANT PROFESSOR OF PHARMACOLOGY: Ph.D. or M.D. Half time teaching, half time research. Salary and rank depending on experience. Send prospectus to Dr. Alfred W. Brody, Creighton Medical School, Omaha 2, Nebraska.

• ASSISTANT PROFESSOR OF ANATOMY: State medical school, southwest. Opening for histologist-embryologist with research interests. Ample time and facilities for investigative work. Salary dependent on past record. Address: V-49.

• MEDICAL MICROBIOLOGIST: Full-time faculty position in eastern medical school department of bacteriology. Teaching of medical and graduate students. Time for research. Rank and salary depend on experience and training. Address: V-50.

To aid in solution of the problem of faculty vacancies, MEDICAL EDUCATION will list persons and positions available, as a free service. The school department or person may have the option of being identified in these columns or of being assigned a key number for each position listed. Mail addressed to key numbers will be forwarded to the person or department listing the request.

Information for these columns should reach the Personnel Exchange, Journal of Medical Education, 185 N. Wabash Ave., Chicago 1, Ill., not later than the 10th of the month which precedes the month in which the listings will appear.

Personnel Available

• PATHOLOGIST: 33, board certified in pathologic anatomy and clinical pathology. M.D. Illinois, 1945. Experience in diagnostic pathology, experimental pathology, and teaching. Faculty appointment. Publications. Desires position combining hospital pathology with opportunity for teaching and research. Address: G. A. Nedzel, 45 E. Bellevue Place, Chicago 11, Illinois.

• INTERNIST: Hematology, radiobiology subspecialties. Passed Internal Medicine Board written examination. Four years radiation-hematology research. Director radioisotope laboratory. Desires academic-type research position with opportunity for clinical hematology teaching and practice. Available summer 1956. Address: A-219.

• MEDICAL JOURNALIST: Woman writer and photographer. Medical social work education. Experienced in magazine layout and production. Seeks publicity or magazine position in midwest or western area. Address: A-247.

• PARASITOLOGIST: Ph.D., male, unmarried. Has Ph.D. in parasitology from University of California, Berkeley, California. Two and a half years of experience in teaching and research in parasitology. Currently engaged in a study of the epidemiology of certain parasites of animals and man; engaged in summer in studies of fauna in Arctic areas. Desires teaching position. Have prepared lecture notes in medical and veterinary entomology, helminthology and protozoology and medical bacteriology. Address: A-222.

• INTERNIST: 34, Australian, M.D., M.Sc. seeks university clinical research teaching post with view to permanent residence in U.S.A. Excellent training in basic sciences (pathology, bacteriology) and internal medicine in Australia, England, France, U.S.A. Publications, society membership, teaching experience. Main interest cardio-pulmonary disease. Would accept fellowship initially in cardio-pulmonary group. Address: A-223.

• DERMATOLOGIST: Diplomat of American Boards, candidate for Ph.D., with extra training in microbiology and histopathology, interested in clinical, research and teaching opportunities. Age 33; draft exempt. Department head preferred. Address: A-224.

• PARASITOLOGIST: M.S., Ph.D., certificate in tropical and military medicine. Retired army officer, 54, with 15 years experience in university teaching of undergraduates and graduates and 13 years varied experience in field, laboratory and teaching in army. Desires full or part time position in medical school. Special interest parasitology and tropical medicine. Scientific publications, books. References. Available in fall. Address: A-225.

• PARASITOLOGIST: Ph.D., June 1956. Experienced in teaching, laboratory and field research, desires teaching and/or research position in Parasitology, related fields or basic medical science. Available May, 1956. Eastern location preferred but others considered. Address: A-226.

• PHYSIOLOGIST, PARASITOLOGIST: Ph.D. University of Michigan. Twenty years experience teaching and research. Willing to teach nurses, medical technologists, etc. Desires full time academic appointment. Address: A-228.

• INTERNIST: 35, present medical school faculty member. Rounded clinical and teaching experience. Extensive original investigation, publications in metabolism and related fields. Radioisotope techniques. Board certified. Desires full-time teaching position with opportunity for investigative contribution. Address: A-229.

• ANESTHESIOLOGIST: Foreign graduate; female; trained in institution with medical school connection. Seeks position with teaching institution or similar. Address: A-230.

• PHARMACOLOGIST: Ph.D. 29, atomic research, publications, some teaching. Entering junior year of medical school. Desires part-time academic post to complete medical program. Address A-321.

• PHYSIOLOGIST-ZOOLOGIST: Ph.D., 34. Training and interest in endocrinology and cell physiology. Presently engaged as research associate in biochemistry. Desires academic and/or research position. Address: A-232.

• BIOCHEMIST: Ph.D. Now assistant professor of biochemistry at medical school. Fifteen years' teaching experience, over 40 publications in the field of enzymes, proteins, lipids and biochemistry of cancer. Seeks position in institution with good research facilities and appropriate remuneration. Excellent references supplied on request. No regional preferences. Address: A-235.

• INTERNIST-PHYSIOLOGIST: 34. Interests in cardiovascular research and teaching. Experienced in cardiac catheterization. Presently full time faculty appointment. Desires academic situation offering future and opportunities in field of stated interest. Address: A-236.

• MICROBIOLOGIST: Ph.D., 31, married. Five years teaching experience in general and medical bacteriology, immunology, mycology, and virology. Total of six years experience in virus and cancer research. Presently engaged in full-time virus research. Desires faculty appointment (asst. prof.) with teaching and research opportunities. Address: A-237.

• INTERNIST: 39. Especially interested in metabolism. Previous experience with isotopes. Certified by American Board in internal medicine. Fellow of American College of Physicians. Would be interested in heading section or department in geographical full-time teaching position with a medical school Assistant professor of medicine past two years. Outstanding record including numerous publications in the past. Address A-238.

• Obstetrician-Gynecologist: 38. F.R.C.S. (C). Canadian. Married. Board eligible. Presently holding teaching fellowship in Canadian university, wishes part or full time teaching appointment in American university. Address: A-239.

• VETERINARY PATHOLOGIST-BACTERIOLOGIST: D. V.M., Ph.D., 37, male, married. Background in comparative pathology, infectious diseases and mycology. Nearly 8 years research experience and part time teaching. Assistant professor, member of a number of scientific organizations. Publications. Desires position primarily research with minimum of teaching. Would consider medical school appointment with opportunity to complete requirements for M.D. degree. Address: A-240.

• PUBLIC RELATIONS DIRECTOR: Top medical center experience. Seeks growth opportunity in medical administration. Address: A-241.

• OPHTHAMOLOGIST: 32. Three years approved residency in ophthalmology from a large teaching general hospital. Desires teaching or research fellowship in ophthalmology at a medical-hospital institution or preceptorship under ophthalmoligist. Address: A-242.

• BIOCHEMIST: Ph.D., Columbia University, 1940. Good background in teaching and research. Associate professor of biochemistry; numerous publications on chemistry and metabolism of steroid hormones. Presently completing two year visit in English medical college. Available USA, fall, 1956. Address: A-243.

• PHYSIOLOGIST-PHARMACOLOGIST: Ph.D. 36, married. Metropolitan N. Y. area only. Full or part-time teaching and/or research position in medical or dental school or membership in hospital research team. Seven years teaching undergraduates biology, chemistry, zoology, physiology, anatomy; dental students physiology, pharmacology; medical students pharmacology. Faculty member of eastern medical school. Four years in hospital research laboratories. Publications. Address A-244.

• MEDICAL WRITER: Ph.D. in physiology with research experience and publications. Desires full ar part-time work writing abstracts, editing manuscripts and assisting with medical publications. Address: A-245.

• PHYSIOLOGIST-PHARMACOLOGIST: Ph.D. Research experience. Publications. Desires opportunity to affiliate with laboratory doing research in endocrinology, reproduction or pharmacology. Interested in institution for which senior post-doctoral fellowship can be granted by National Science Foundation. Metropolitan N. Y. area only. Address: A-246.

Publications

Useful information for both medical educators and students is published by the Association of American Medical Colleges. These publications may be obtained either free of charge or at cost from the Association headquarters office, 185 N. Wabash Ave., Chicago 1, Ill.

Booklets

Medical Education Today ($1.50).
Report of the Conference on Preventive Medicine in Medical Schools (clothbound, $1.50).
Admission Requirements of American Medical Colleges—1956 ($2.00).
Fellowships, Funds and Prizes Available for Graduate Medical Work in the United States and Canada—4th Edition published 1954. ($1.50).
By-Laws of the Association of American Medical Colleges (Revised 1955).
Minutes of Proceedings of the Annual Meetings (1947-1955 Minutes now available).
Public Understanding and Support of Medical Education.

Journal of Medical Education

Journal Supplements available:
The National Health Service of Great Britain ($1.00).
Medical Education in Time of National Emergency ($1.00).
The Critical Cataloging of Medical Films ($1.00).
The Teaching of Physiology, Biochemistry and Pharmacology (Report of the 1953 Teaching Institute)—$2.00, paperbound; $3.00, clothbound.
The Teaching of Pathology, Microbiology, Immunology, and Genetics (Report of the 1954 Teaching Institute)—$2.00, paperbound; $3.00 clothbound.

Medical Audio-Visual Institute Publications

Film Catalog, Fall 1955
Reprints from the Audiovisual News Section of the Journal of MEDICAL EDUCATION.
Films in Psychiatry, Psychology and Mental Health (available from the Health Education Council, 10 Downing St., New York 14, $6.00).
Films in the Cardiovascular Diseases (Part I available from the American Heart Association, 44 E. 23rd St., New York 10, $2.00. Part II available from the Medical A-V Institute, $2.00).
Review of Films in Atomic Medicine.
The Short Motion Picture for Medical Classroom Instruction.
Films published by the MAVI are included in the Film Catalog.

Publications of Related Organizations

Suggestions for Supplementing the Medical Curriculum in Time of National Emergency (Joint Committee on Medical Education).
Hospitals Participating in the Matching Program 1956 (NIMP publication).
Results of the Matching Program 1956 (NIMP publication).
The Student and the Matching Program 1956 (NIMP publication).
Medical College Admission Test—Bulletin of Information 1956 (Educational Testing Service publication).

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